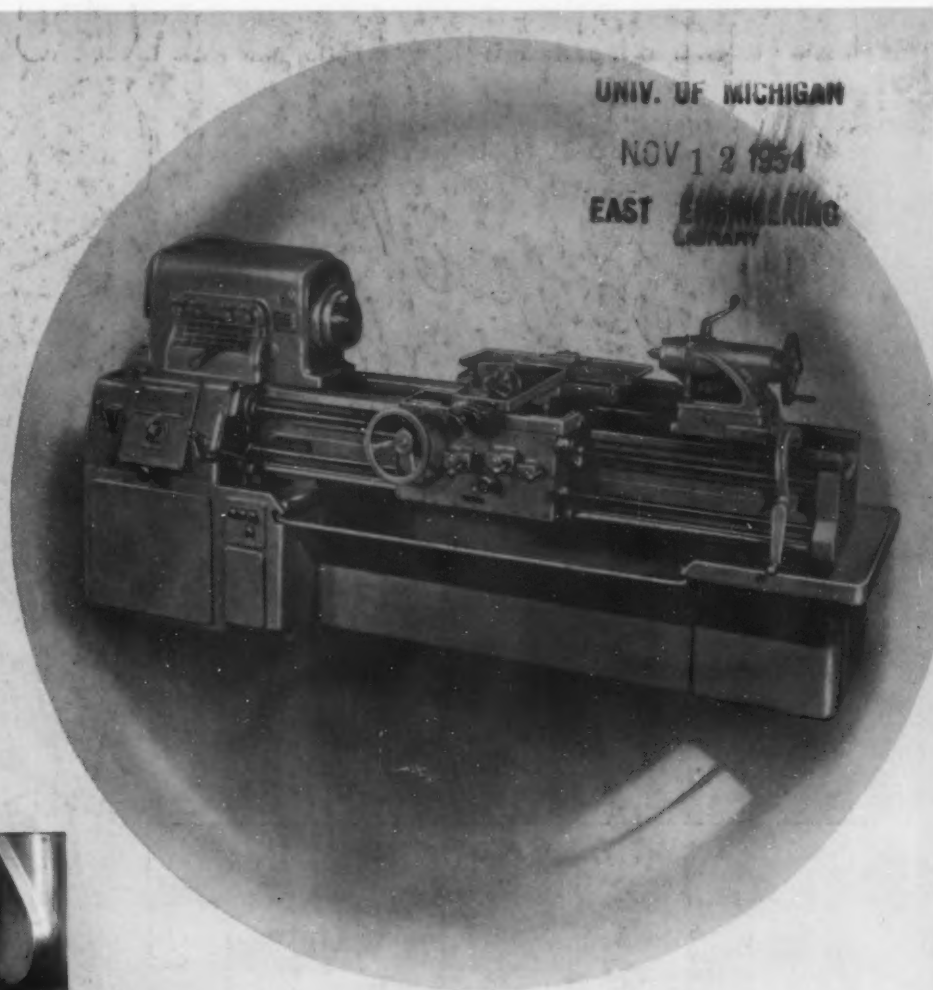


The Iron Age

A Chilton Publication

NATIONAL METALWORKING WEEKLY • NOVEMBER 11, 1954

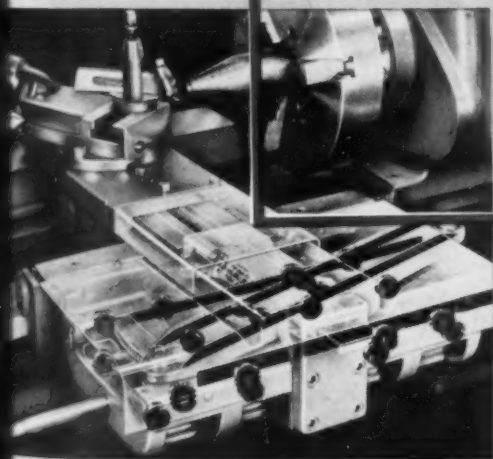
BALL
BEARINGS
make
product
BETTER



UNIV. OF MICHIGAN

NOV 12 1954

EAST ENGINEERING LIBRARY



Twenty New Departure ball bearings are used in the Monarch Machine Tool Company's antifriction bearing taper attachment. There are 12 single-row bearings, 8 double-row bearings. All are permanently lubricated.

NOTHING ROLLS LIKE A BALL



NEW DEPARTURE
BALL BEARINGS

NEW DEPARTURE • DIVISION OF GENERAL MOTORS • BRISTOL, CONNECTICUT
Plants also in Meriden, Connecticut, and Sandusky, Ohio
In Canada: McKinnon Industries, Ltd., St. Catharines, Ontario

Advantages of the Monarch lathe taper attachment are—according to its maker—the result of New Departure ball bearings. By their use, backlash, friction and lost motion are almost entirely eliminated . . . smoother, more accurate tapers are possible. And Monarch's taper attachment takes exceptionally heavy cuts even when tapping or turning acute angles . . . because ball bearings give rigid support under radial and thrust loads—or any combination.

Get your New Departure sales engineer. Have him show you how New Departure ball bearings make a good product even better!

NEW!

ROTOR AIR SCREW DRIVERS AND NUT SETTERS

*Powerful!
Light!*

Rugged . . . long-life construction

More power per pound

Simplified torque adjustment

3 types of drives

Reversible or non-reversible motors



TYPICAL SPECIFICATIONS

Reversible* . . . Adjustable Clutch† Type

| Type | Handle 1/4" Air Inlet | Free Speed at 90# Pres. | CAPACITY Free Run. Screws | Bolt Size | Wt. (Lbs.) | Lgth. (Ins.) | Spindle Side to Center (In.) |
|----------|-----------------------------|----------------------------------|------------------------------|--------------|---------------|-----------------|---------------------------------------|
| S-02-PRC | Pistol | 2000 | #2 to #12 | To 1/4" | 2 1/4 | 8 3/4 | 2 5/32 |
| S-02-PRC | Pistol | 850 | #2 to #12 | To 1/4" | 2 1/2 | 9 1/4 | 2 5/32 |
| S-02-PRC | Pistol | 450 | #2 to #12 | To 1/4" | 2 1/2 | 9 1/4 | 2 5/32 |
| S-02-LRC | Lever | 2000 | #2 to #12 | To 1/4" | 1 7/8 | 10 | 2 5/32 |
| S-02-LRC | Lever | 850 | #2 to #12 | To 1/4" | 2 1/8 | 10 1/2 | 2 5/32 |
| S-02-LRC | Lever | 450 | #2 to #12 | To 1/4" | 2 1/8 | 10 1/2 | 2 5/32 |

*Also Non-Reversible

†Also Positive Clutch and Direct Drive

Here's how
to drive
assembly
costs down



WRITE FOR BULLETIN
No. 46



SCREW
DRIVER

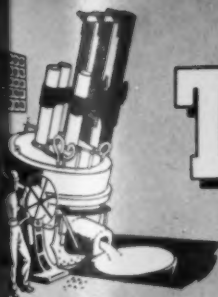
THE ROTOR TOOL CO.

CLEVELAND, OHIO

UNBIASED ANALYSIS OF PORTABLE TOOL PROBLEMS



IMPACT
WRENCH



Tool Steel Topics



BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

In the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation



Keen Edges Hold on Blades of Lehigh H and L

The shear blades shown here are representative of the blades used in pairs in power squaring shears manufactured by Wysong & Miles Company, Greensboro, N. C. The blades are hollow ground, and are made of either Bethlehem Lehigh H or Lehigh L tool steel. They perform economically at speeds up to 60 strokes per minute because they hold their cutting edges for long periods of time, in this way minimizing the need for frequent regrinding.

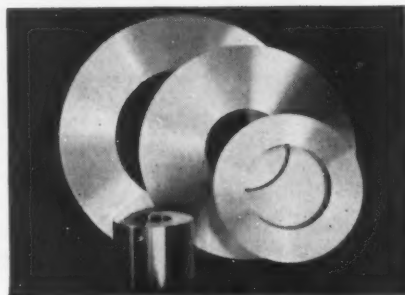
Lehigh H and Lehigh L are high-carbon, high-chromium tool steels. They form high-chromium carbide concentrations, meaning the ultimate in wear.

With its lower carbon content and addition of 1.00 pct nickel, Lehigh L has unusual toughness. It is used for shearing thicker material where shock is involved.

TYPICAL ANALYSES

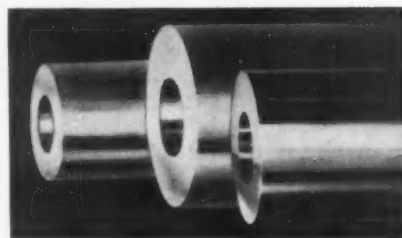
| | C | Cr | Mo | V | Ni |
|----------|------|-------|------|------|------|
| Lehigh H | 1.55 | 11.50 | 0.80 | 0.40 | — |
| Lehigh L | 0.85 | 11.50 | 0.45 | 0.30 | 1.00 |

You can count on good wear-resistance with Lehigh H or Lehigh L. If you would like to have more information about these steels and their use, we suggest that you contact your tool steel distributor, or write direct to us at Bethlehem, Pa.



HOLLOW-BAR TOOL STEEL IS IDEAL FOR RING-TYPE APPLICATIONS

BTR (Bethlehem Tool Room) Hollow-Bar is an excellent steel for hardened bushings, ring dies, draw rings and similar uses (above). It is produced by high-speed trepanning, in which hammer-forged or hot-rolled round bars (below) are cored out, followed by rough turning on the outside. Hollow-Bar saves production time, for there's no need to wait for forged rings or dies. Quick delivery, too, for rings can be cut to any length.



BETHLEHEM TOOL STEEL ENGINEER SAYS:

First Harden the Die, Then the Punch

In making up special punch-and-die sets, the fitting of the punch and die after hardening often involves hand grinding or stoning to remove the size changes produced during the hardening operation. The hole in the die will often close in, while the punch will usually expand in diameter. Thus the two parts will not fit, or will lose clearance.

In order to minimize such difficulties, and to reduce tool costs, the use of the following procedure is recommended:

1. Make up the die, and harden it.
2. Make up the soft punch, and fit it to the die.
3. Harden punch.
4. If necessary, fit punch to die by grinding.

In this way, only one of the two parts is ground in the hardened condition, and the grinding is external and easier than internal grinding. To avoid excessive grinding, it may occasionally be advisable to allow for size-change in the die. But in the main this procedure can bring worthwhile economies.

Starred items are digested at the right

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Address mail to 100 E. 42 St., N. Y. 17, N. Y.

NEWS DEVELOPMENTS

TINPLATE'S CANNING MARKET GROWING FAST—P. 73

Tinplate producers are wading happily into a sea of soda pop. They hope to be swimming in it soon. Pop appears to be the next volume product to keep tinplate producers setting new records. First tried in '50, it really clicked by '53. Fresh milk may be the next big booster of can and tinplate production. Current research is investigating several possible ways of putting more milk into cans. Electrolytic trend continues.

PROPOSE SLIDING SCRAP EXPORT CURB — P. 76

Steel mills and scrap dealers have agreed in principle on a compromise which would link scrap export quotas to steel production rates. But a rhubarb is forming on what the precise correlation will be. Plan will take effect Jan. 1—if it's okayed.

ATOMS BOOST PLASTIC'S HEAT RESISTANCE — P. 77

Irradiation of fabricated polyethylene products ups temperature range to 300°F. Firm already produces laboratory and hospital equipment. Tried experimentally by cannery as stainless replacement. See many other applications in food, chemical industries.

BUILDER PREDICTS GROWING TANK INDUSTRY — P. 80

E. N. Gosselin, president of Graver Tank & Mfg. Co., Inc., tells THE IRON AGE that industrial tank volume for 1954 will surpass 1953. He feels that population growth, chemical and petroleum expansion insures a steady upturn with keen competition.

ELECTION WON'T ALTER BUSINESS OUTLOOK — P. 91

Don't expect any startling changes in business conditions as a result of the Democratic election victory. Factors that will keep economy uptrending through '55 aren't affected. Election underlined basic similarities of the two parties—the big split being internal in each. Republican and Democratic parties both have liberal and conservative factions. And national control is near "center."

CHRYSLER BIDS FOR PRESTIGE MARKET — P. 94

Company's new Imperial line has distinctive features, separate body, own assembly line. Will help Chrysler Corp. to establish identity in top quality car field as a full-fledged competitor with Cadillac, Lincoln.

ENGINEERING & PRODUCTION

COMPACT UNIT PLATES COATINGS ON WIRE—P. 117

Heavy, ductile coatings of copper, nickel and other metals are now applied economically to steel wire with a plating unit which only occupies a 30 x 60-ft floor space. Compact design is made possible by spiralling the wire through the plating baths. Application of proper thickness of copper on steel cuts costs.

GOOD DIE LAYOUTS CUT MATERIAL COSTS—P. 122

Material costs can often be reduced with die layouts designed to utilize a greater degree of stock. Most parts resemble one of the standard geometrical figures and can be arranged to keep scrap losses at a minimum. Totally "scrapless" designs may be used where tolerances permit.

AUSTENITIZING STUDIED ON ALLOY STEELS—P. 124

Austenitizing conditions are important factors affecting the transformation characteristics of steels. In this investigation of three medium alloy steels, 4695, 9395 and 8695, the effects of temperature and time in heat treating were closely studied.

HYDRAULIC PRESSES SPEED PARTS ASSEMBLY—P. 127

A battery of nearly 100 small to medium hydraulic presses has reduced breakage and stepped up assembly of small toy parts. As assembly requirements change, presses are light enough for portability, can be moved to the work to cut part handling. Operators approve of the machine's safety and noiseless features.

STEEL MILL HANDLING SYSTEM AUTOMATED—P. 130

A completely automatic steel mill handling system consisting of four major components, moves coils of wire from the reels to storage and shipping. Transfer of coils is done with a special bobbing mechanism and an automatic water-quenching section is also built into the line.

MARKETS & PRICES

U. S. STEEL PUSHES WHITE XMAS SALES — P. 75

U. S. Steel's Operation Snowflake is a big promotion campaign aimed at boosting appliance sales. Hatched in the Corporation's Market Development Div., the project was top secret until after mid-year. It is expected to reap a lot of goodwill from customer purchasing agents who may be inclined to feel kindly toward a supplier that helps in selling their products. What's more, every appliance sold means more steel shipped. May forecast other promotions.

STEEL WAREHOUSES BALANCE INVENTORIES — P. 83

Warehouse buying from mills catches up with sales rate. It was trailing by 15 pct during first half of this year. See return to general inventory turnover every 4 months. Some spot shortages are bringing mill-quantity buyers back to warehouses.

ANXIETY OVER STEEL SUPPLY SPURS BUYING — P. 169

Anxiety over future steel supplies is causing some consumers to engage in protective ordering. Mills believe some consumers of cold-rolled sheets are placing or attempting to place first quarter orders before they actually know what their requirements will be. If present ordering is a fair sample, there will be a shortage of sheets in January and February.

MILLS MAY ALLOCATE COLD-ROLLED SHEETS — P. 170

Several producers are readying plans to put cold-rolled sheets on an allocation basis to straighten out order scramble. Fourth quarter booked solid, and many mills have shut doors on first quarter commitments. Bars, and hot-rolled sheets show some improvement.

DOMESTIC COPPER MARKET STAYS TIGHT — P. 176

Despite the release of considerable tonnages of government copper, the market is staying very tight. Producers are sticking to the 30.00¢ price but scrap and dealer copper are rising.

NEXT WEEK:

QUALITY, MECHANIZATION SHELL MOLD ADVANTAGES

The shell molding process, with its improved foundry product, has proved highly adaptable to mechanization. New automatic and semi-automatic equipment forms, cures, and ejects shells at a high production rate. This winning combination is helping to improve the industry's competitive position.

EAST GERMANS FIND MACHINE TOOL MARKETS

Communist-controlled East German machine tool builders now offer a full line of old-fashioned but well-built equipment. Prices are lower than those of the West—and can be cut to serve political ends, beating any competition. Deliveries of machine tools from East German manufacturers are prompt.

Need a long-life chain for furnace service?



Aluminum billets move through normalizing furnace at 900°F on Link-Belt Class SM-584 chain with "K" attachments. Cast center links are connected to bar steel sidebars by steel pins locked in place.

Specify LINK-BELT SM or SMGL ...chains that are right for the job

THESE combination chains are designed and built for the demanding service of moving materials through normalizing and heat treating furnaces. Their sturdy, well-proportioned members maintain fit despite hard usage at high temperatures.

The extra life built into these chains is typical of every chain in the complete Link-Belt line.

Accurate control of raw materials and manufacturing processes is your assurance of uniformity and long life.

For complete information on chains and sprockets for conveying or drive service, get in touch with your nearest Link-Belt office or distributor. They can show you the *one* chain that's best suited to your needs.

LINK-BELT

CHAINS AND SPROCKETS

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

13,523

No ONE chain serves every purpose—choose the *right* one from the complete line



Class SM and SMGL combination chains are ruggedly built for conveyor service in furnaces.



Class 1100 Roller Chain — For rolling conveyors and inclined rolling elevators operating under normal conditions.



Class SS bushed roller chain with offset sidebars—for heavy drive service at moderate speeds.



Transfer chain with tilting dogs—for plate and slab travel, loads up to 300,000 pounds.

dear editor:

letters from readers

Inventory Cards

Sir:

In the newsfront of Oct. 7 there appeared a short article on the use of preprinted and prepunched inventory cards to provide a daily inventory accounting on stock items.

It would be greatly appreciated if you could provide detailed information on the use of this system or advise as to where and how it may be obtained. *H. A. Hansen, Buyer, Liberty Powder Defense Corp., Baraboo, Wis.*

Further information on the new continuous system for controlling finished stock inventories may be obtained from Carbology Dept., General Electric Co., 11177 E. Eight Mile Road, Detroit 32, Mich.—Ed.

Leaded Steels

Sir:

We are interested in obtaining 25 copies of the article "Four Factors Determine Selection of Leaded Steels" by F. J. Robbins which appeared in your issue of Oct. 7. *J. W. Atkinson, Manager, Advertising Production, J. T. Ryerson & Son, Inc., Chicago.*

Sulfur Treatment

Sir:

On p. 85 of your Oct. 14 issue you described a sulfur treatment which extends the life of bearings.

We would appreciate getting the name of the firm in France which has developed this process. *L. L. Ross, Purchasing Dept., The Emerson Electric Mfg. Co., St. Louis.*

For further details on the sulfur treatment and for the name of the firm which developed the process, write to the U. S. Dept. of Commerce, Office of Technical Services, Washington 25, D. C. Mention their "Newsletter" No. 63, Sept. 1954 in your request to them.—Ed.

Inheritance Taxes

Sir:

I have taken particular interest in your article on "How to Save

Inheritance Taxes" in the Oct. 7 issue. Since I have missed Parts I and II, I would appreciate receiving the complete article. *Frank Savo, Daystrom Instrument Div., Archbald, Pa.*

Cold Cleaner

Sir:

In the newsfront section of the Oct. 21 issue of THE IRON AGE you mention a new product that has caught our interest. This product is described as a nonsolvent-type cold cleaner effective on steel parts.

We would appreciate your furnishing us the name of the firm that we should contact for further information on this cleaner. *F. L. Strobeck, Business Manager, Federal Prison Industries, Inc., Lewisburg, Pa.*

More details on this cleaner may be obtained by contacting E. F. Houghton & Co., 303 West Lehigh Ave., Philadelphia 33, Pa.—Ed.

Steel

Sir:

I should like to have three tear sheets of pp. 42 and 43 of your Sept. 30 issue containing the article "Steel: Chart Finishing Mill Growth" and the "1954 Finished Steel Capacity by IRON AGE Districts." *David Knox, Applications Engineer, Industrial Nucleonics Corp., Columbus, Ohio.*

Strapping

Sir:

We read with considerable interest the feature article "Strapping: Sales Barometer Climbs" in the Sept. 23 issue of your magazine.

We are wondering if it would be possible to secure ten tear sheets of this article. If so, kindly send these to my attention. *D. F. Downing, A. J. Gerrard & Co., Melrose Park, Ill.*



a4in1

metal working tool!

di-acro* BOX FINGER BRAKE

Accurately, Easily, Quickly Form and Duplicate a Wide Variety of Shapes in Metal as Heavy as 16 Gauge—Widths up to 24"—with Versatile Di-Acro Brakes.

A number of forming jobs can be done with the Di-Acro Box Finger Brake, by simply adjusting or changing the type of mounting bar on the contact surface. Di-Acro Finger Brake is:

- **Box and Pan Brake** — when equipped with a complete set of Box Fingers.
- **Open End Brake** — when Open End Finger is installed in place of Box Fingers.
- **Bar Folder** — when an Acute Angle Bar replaces the Box Finger Bar mounting.
- **Standard Brake** — when a Forming Bar is mounted for heavy operations.

Di-Acro Standard and Radius Brakes are also available. Ten models in all.

*pronounced Die-ack-ro

WANT MORE INFORMATION?

Send for New 32-Page Catalog

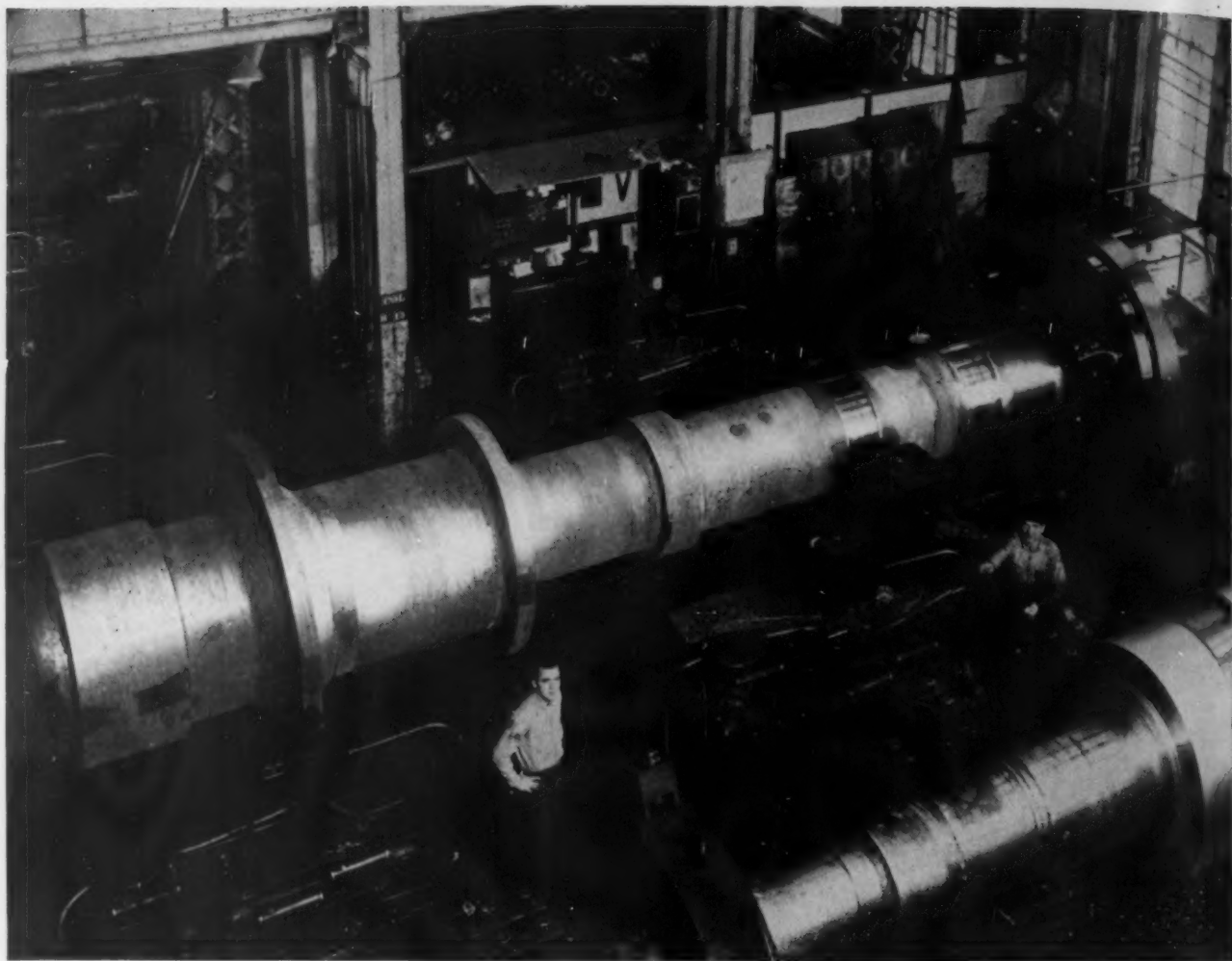


Gives facts on Di-Acro Brakes and also both hand and power operated Di-Acro Benders, Notchers, Punch Presses, Rod Parters, Rollers and Shears. Mail your request today.

Creators of
"Die-Less Duplicating"

O'NEIL-IRWIN
MFG. CO.
302 Eighth Ave.
Lake City, Minn.

di-acro
PRECISION
METALWORKING
MACHINES



THE TURNING POINT *for a Stronger Forging*

Product —

Hydro-electric
Power Shaft

Overall Length —

34' 8 1/2"

Body Diameter —

38 1/2"

Flange Diameter —

96 1/2"

Bore Diameter —

17"

... is not the machining of this 96-ton generator shaft, but the number of intricate forging operations performed by Midvale craftsmen. The 116" octagon ingot, poured at Midvale for this shaft, required a 14,000-ton press to exert tremendous pressures to upset and draw it out for full strength and toughness . . . especially the large thrust collar which is 96 1/2" in diameter. Then after it was carefully worked to a rough shape it was put in this 100" lathe for machining and boring.

The same skill, care and proved-practices are used by Midvale forgers in making all Midvale

forgings for steam turbine shafts, generator rotors, marine reduction gears, pinions and other heavy machinery parts. Quality tests confirm this skill and experience of Midvale steel-makers every step of the way from the furnace to finishing operation.

Have your engineers and designers specify Midvale forgings engineered and made for maximum service. Whether 300 or 300,000 pounds they are noted for their toughness, long service and never-failing performance. Write, wire or phone your forging problems to us. Midvale engineers are always at your service.

THE MIDVALE COMPANY-Nicetown, Philadelphia 40, Pa.

Offices: New York, Chicago, Pittsburgh, Washington, Cleveland, San Francisco

MIDVALE

FORGINGS, ROLLS, RINGS, CORROSION AND HEAT RESISTING CASTINGS



fatigue cracks

November

So you think November is good only for Thanksgiving? Not by a long shot. Here are some other November holidays well worth celebrating. The whole month, for instance, is both "Butter - Baked Turkey Time" and "Gift Cheese Shopper's Time." Take your pick. Other important dates to remember:

November 7-13 Cat Week

November 13 Sadie Hawkins Day

November 15-21 Optimist Week

November 18-25 National Accordion Week

November 21-27 National Cage Bird Week

November 23-30 Send \$1 to Bill Coffey Week*

New Books

Just received the list of new books from the U. S. Government.

THE LIVING WATERS—this is a story about water and people. It tells how water helps us and how we harm water by making it dirty. It also tells how we keep our water clean.

HOW CHILDREN CAN BE CREATIVE—as children become acquainted with their world, they begin to use the objects and materials around them to express their thoughts. Tells parents how to duck.

ROSTER OF ATTORNEYS REGISTERED TO PRACTICE BEFORE THE U. S. PATENT OFFICE—a penetrating listing of names and addresses.

THE SOUTHERN CORNSTALK BORER—we thought most of the borers commuted on the Stamford local. Opened our eyes.

BOY'S SPORTS-OUTERWEAR SIZE MEASUREMENTS — Volume I deals only with outerwear. Very careful analysis, but in this reviewer's opinion suggest you wait for Volumes II, III and IV promised by the Democrats in 1956.

by William M. Coffey

Letters

Mr. F. H. N. Carter, Vice-President of the Sunrod Manufacturing Corporation, New York City, congratulates us on the new format of your ffj by saying "*C'est magnifique.*" Rough translation "it's the berries." He also says "*By the way, now you only have to write about half as much. What do you do with the rest of your time?*" Rough translation: By ze by, maintent vous travez pour seulement demi, q'est-ce que c'est que c'est pour outre demi?"

"*Monsieur Carter, Mon dieu, nous put le ink dans le boite pour la plume!*" Rough translation: We fill inkwells.

Puzzlers

"One bright and cheery morning, J. Scratchmoritch started to dunk a slightly stale bagel (often termed a "petrified doughnut") in a cup of coffee, which happened to be nine-tenths full. The bagel accidentally slipped from his hand into the cup, where it floated. He noted that no coffee was spilled and that the cup was now full to the brim. He also noted (a very observant and meticulous fellow, this Scratchy) that the diameter of the cup (assume the cup to be a hollow semisphere) was equal to the diameter of the bagel, and that the diameter of the hole in the bagel was 2 in. less than the outside diameter. The bagel had one-third of its volume submerged under the stated conditions. What was the diameter of the cup mouth or bagel?"

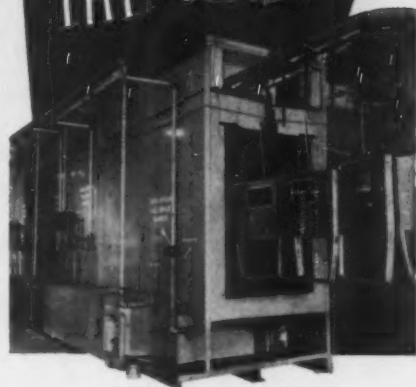
Bon Mot For Today

"If you are calm and collected while others about you are losing their heads, maybe you just don't understand the situation." This is donated by Bob Edmiston of the the American Optical Company, who we understand knows what he's talking about.

*Do not send \$1 to Iron Age. Send to Bill Coffey, MacArthur Lane, Stamford, Conn.

Do a Better Job Faster...

cut cleaning costs
RIGHT DOWN
THE LINE!



METALWASH Phosphatizing Machine
at the AUTOCAR DIVISION of the WHITE MOTOR CO.

METALWASH Phosphatizing Machine
provides superior pre-paint surface
at PROVEN COST SAVINGS

METALWASH-designed Phosphatizing Machines are available for every application from the simple phosphate-cleaner to the multi-stage wash, rinse, phosphate coat, rinse, acid rinse, and dry machines.

"... with our **METALWASH** Phosphatizing Machine we have achieved substantial product improvement and considerable cost saving, together with elimination of paint failures in the field," states Robert Hood, Supervisor of Mfg. Research of the Autocar Division of the White Motor Co.

METALWASH SPRAY PICKLING MACHINE is a production method in preparation for enameling, plating, phosphating; in removal of annealing scale after heat treatment.

METALWASH PARTS WASHERS, designed for alkaline-, neutral emulsion-, or solvent-type cleaners, are manufactured in five basic types.

METALWASH VAPOR DEGREASERS provide new speed, economy, durability.

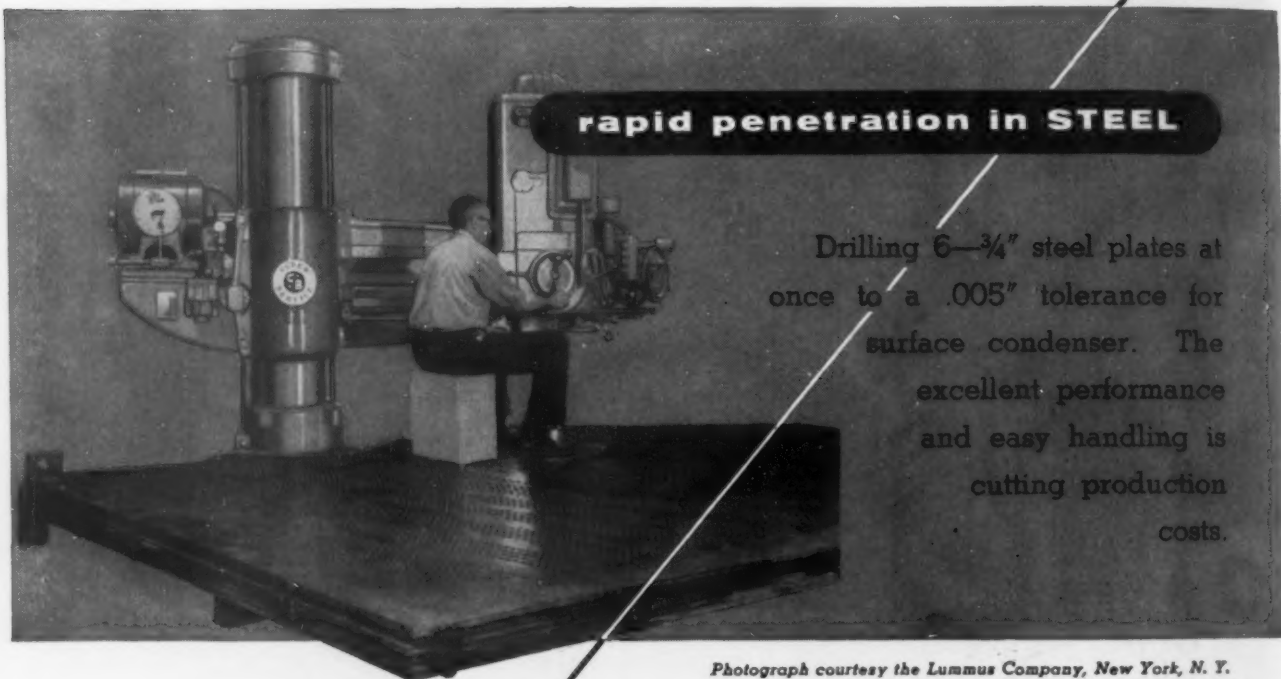


METALWASH MACHINERY CORPORATION
920 North Avenue, Elizabeth 4, N. J.

rapid drilling with ACCURACY saves money

at THE LUMMUS COMPANY

On jobs like these the ease of control, the accuracy and the outstanding speed of penetration of Cincinnati Bickford Radial Drills pay big dividends.



rapid penetration in STEEL

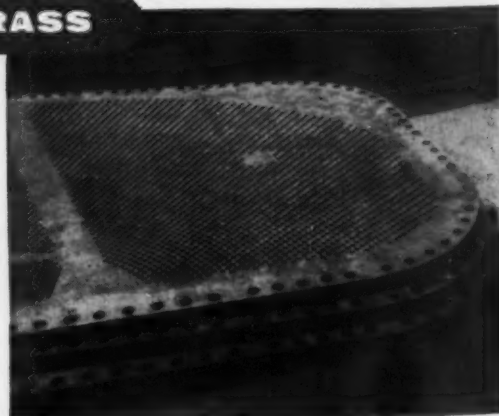
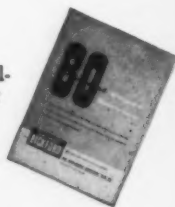
Drilling 6- $\frac{3}{4}$ " steel plates at once to a .005" tolerance for surface condenser. The excellent performance and easy handling is cutting production costs.

Photograph courtesy the Lummus Company, New York, N. Y.

rapid penetration in BRASS

Drilling 4 brass tube sheets, 1 $\frac{1}{2}$ " thick, simultaneously to a .002" tolerance, a special spiral brass drill penetrates at the rate of 10" per minute.

Of interest to every user of Drilling Machines—Write for your copy of 80-year Anniversary Booklet.



... **CINCINNATI
BICKFORD**



RADIAL AND UPRIGHT DRILLING MACHINES

.....
THE CINCINNATI BICKFORD TOOL CO.

Cincinnati 9, Ohio, U.S.A.

TINPLATE: Canning a Bigger Market

Soda pop appears to be the next volume product to keep tinplate producers setting new records . . . First tried in 1950, it really clicked in '53 . . . Fresh milk may be next big booster—By J. B. Delaney.

♦ U. S. TINPLATE producers are wading happily into a sea of soda pop. They're hoping to be swimming in it before long.

The combination of tinplate and soft drinks may turn out to be a real bonanza for the industry. This and other new applications that may blossom into reality in the near future could trigger an expansion program far beyond the most optimistic predictions of a few years ago.

First Try Failed

Tinplate and soft drinks have been courting each other since 1938 when the Cliquot Co. tried to switch from bottles to cans. But a suitable container was not available at that time. Meanwhile both the producers and the can companies made tremendous technological strides that brought canned soda pop within reach.

Walter S. Mack, then head of the Pepsi-Cola Co., tried it in 1950 but ran into steel shortages and the economic incompatibility of tinplate and 5-cent pop. Mack, now president of National Phoenix Industries, finally turned the trick last year and American soda pop guzzlers took to the idea. Soft drinks in bottles now sell generally for 7 to 10 cents.

Can Output Climbs

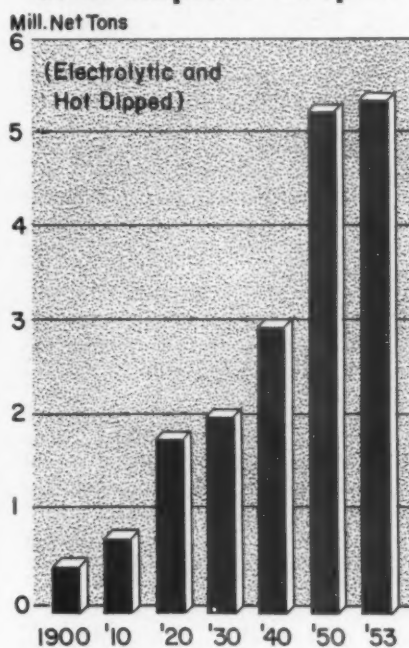
In 1953 an estimated 10,000 tons of tinplate went into soft drink cans. Estimates of 1954 requirements range between 75,000 and 100,000 tons. It is expected that 750 million soft drink cans will be produced this year. And to give some idea of the potential: Every year the equivalent of 27 billion

bottles of soft drinks are consumed in the U. S. A switch from bottles to cans of only 25-30 pct would represent approximately 500,000 tons of tinplate.

Industry sources point out that in 1953, a record year, 36 billion cans were produced to handle the year's entire pack. Cans consumed 4.1 million tons of tin mill products in that year.

A Western brewer has stopped canning beer and switched entirely to soft drinks. Other beer makers, including some of the biggest, have plunged into soft drinks through subsidiary companies. Still on the fence, though, is Coca-Cola, which accounts for 50 pct of soda pop sales. It's keeping a close watch on how consumers take to the canned pop idea.

U. S. Tinplate Output



Advantages of cans over bottles include (1) no deposit, no returns; (2) quicker to cool in refrigerator or dispensing machine; (3) take up less storage space; (4) bottlers have fewer dollars tied up in stock; (5) cleaner than re-washed bottles; (6) no losses from breakage; (7) less trouble for retailers, and (8) easier and cheaper to ship.

Changeover Costly

A big problem: Getting bottlers to switch from bottles to cans. Changeover costs range from approximately \$10,000 to modify equipment to handle cone-top cans, to about \$50,000 for new machines to accommodate flat-top containers. Smaller outfits don't have that kind of money. A possible solution: Pooling of resources to equip a common bottling plant to serve bottlers in a given area.

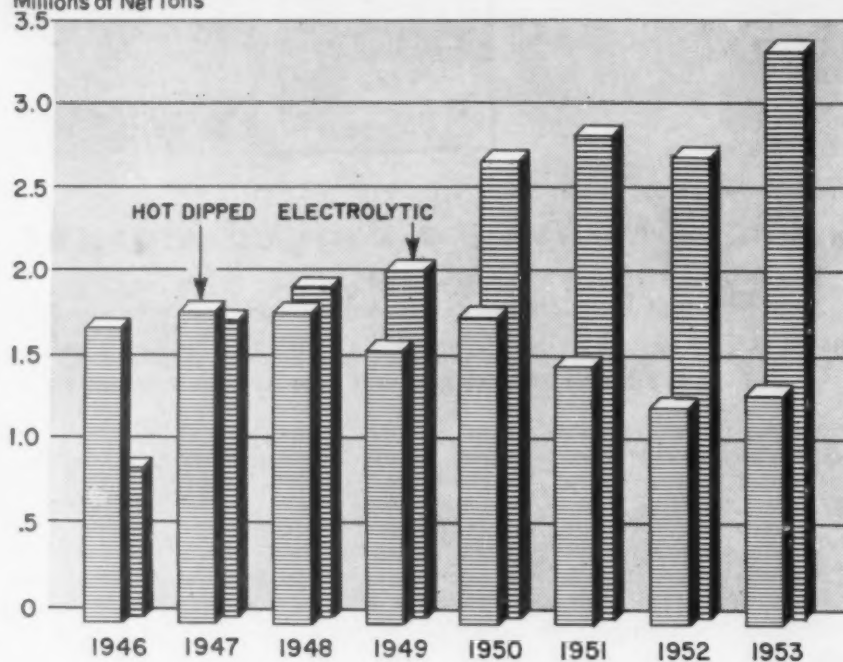
Beer, Juice Help

Soft drink canning is one of many new applications that has helped sustain tinplate sales and encourage expansion in electrolytic capacity. New electrolytic lines were brought into production within the last 3 years by U. S. Steel at Fairless Works and Geneva-Columbia Div., Jones & Laughlin, Wheeling, Bethlehem, and Kaiser. Speed of many existing lines has been increased.

Other new outlets for tinplate include canned beer and frozen food concentrates. Last year some 615,000 tons went into beer cans compared with 492,000 tons a year earlier, 86,000 tons in 1940. Frozen concentrates used at least 75,000 tons in 1953, with frozen orange juice alone consuming 1.2 billion

Electrolytic Tinplate Growth

Millions of NetTons



cans compared with approximately 200 million cans five years ago.

The industry has other irons in the fire for the future. University of Wisconsin's research program to develop a process for canning fresh milk is an example. If this clicks, the potential, as one tinplate sales executive puts it, "is somewhere in the stratosphere."

Wisconsin, America's "Dairyland," hopes to increase per capita consumption of milk through shipping and handling economies which might ultimately reduce cost to consumer, and by making it possible for the consumer to store more milk in less space. Problems: Reconstituting concentrates to taste like fresh whole milk, and local and state laws.

In addition, tinplate producers can look forward to a natural growth in consumption through increase in U. S. population. Dept. of Commerce estimates that U. S. population will reach 180 million by 1960 compared with 160 million at present. Even without an increase in per capita consumption, tinplate producers estimate that population growth will hike tinplate usage by 500,000 tons. And they point out that between 1915 and 1953 per capita consumption rose from 24 lb. to 104 lb., not including beer, baby food, and general line items such

as oil, dog food, and many other food products.

The industry has come a long way since 1900 when approximately 500,000 tons of tin mill products went into the canning of food, canister sets, snuff boxes, tobacco cans, and perhaps toys. Snuff boxes were a major item in those days. By 1910 production had risen to 800,000 tons; by 1920 to 1.8 million tons. It exceeded 2 million tons in 1930, reached 3 million tons by 1940. In 1950 it was 5.3 million; in 1951 a record 5.6 million; in 1952, when a strike hurt production, just over 5 million; in 1953, 5.4 million. This year's output will approximate that of 1953.

Electrolytically deposited coatings became a factor in 1937 when the first commercial line was brought into production at U. S. Steel's Gary Sheet and Tin Mill.

As electrolytic capacity has increased, hot-dip has declined. In 1942 electrolytic mills shipped approximately 82,000 tons. A year later it was 330,000 tons and by 1946 it had touched 900,000 tons. Last year electrolytic shipments totaled 3.3 million tons and will approach 3.6 million this year. Meanwhile, hot dip shipments declined from 3.5 million tons in 1941 to 1.9 million in 1946 and 1.3 million last year. This year's shipments will

hit approximately 1.1 million tons.

Producers feel that eventually electrolytic tinplate will account for 95 pct of all coated products. A refinement of this product, dual-coat, where the tin coating is heavier on one side than the other, has made considerable headway in the last several years. Last year it is estimated that some 300,000 tons of dual-coat were produced.

Steelmaking:

Start up oxygen-bessemer plant in Canada.

First oxygen steelmaking plant in North America has been placed in operation by Dominion Foundries and Steel, Ltd., at its Hamilton, Ont., works. Process was developed in Austria where the first two commercial scale plants utilizing the process have been in operation there for some time. Capacity of the new plant is 1000 tons daily.

Previous articles on oxygen steelmaking were published in The Iron Age July 2, 1953, p. 75; July 23, 1953, p. 63; Sept. 24, 1953, p. 127; and May 27, 1954, p. 81—Ed.

In the U. S., McLouth Steel Corp., Detroit, and Kaiser Steel Corp., Fontana, Calif., are currently installing similar equipment.

Dofasco purchased the Canadian patent rights of the European process more than a year ago. The process consists of impinging high purity oxygen on the surface of the charge of scrap, molten iron and necessary fluxing materials. Approximately 1 cu ft of oxygen per pound of steel, or 170 pounds per ton of steel, is required.

Proportion of Dofasco's steel that will be produced by the new method has been estimated between 60 and 80 pct.

This recently completed plant is possibly the most spectacular part of the company's \$50 million expansion and modernization program which started at Dofasco in 1950 and which is expected to be completed next year when a new 56-in. cold-rolling strip mill, and 60,000-ton-per-year continuous galvanizing line will be put into operation.

SALES: U. S. Steel Helps Customers

U. S. Steel's Operation Snowflake backs up Christmas appliance sales campaigns . . . New customer service concept . . . Line up makers, utilities, mass media . . . Plans reach to store level—By J. B. Delaney.

♦ ONE OF THE BIGGEST Christmas promotions in years is the brain child of a steel company—U. S. Steel Corp. You'll be hearing a lot about it before Santa empties his pack and heads wearily home to the wife and kids.

In the trade it's called "Operation Snowflake." Its slogan: "Make it a White Christmas—Give Her a Major Appliance." It's likely to bring cheers from Mama, pocket-book deflation for Papa.

Why did U. S. Steel Corp. father a promotion to stimulate the sale of appliances? How was it done? The answer to the first question is both obvious and interesting. The mechanics of it constitute a practical education in the business of selling.

Results will be studied carefully by U. S. Steel's competitors—and steel customers. It could lead to a revolution in the business of selling steel.

The idea was hatched in the offices of U. S. Steel's Market Development Div. in Pittsburgh early this year. It was "top secret" until midyear when all the guns were loaded and ready to fire the first salvo to likely participants. It hit the target and the resulting explosion has been mushrooming like the aftermath of an A-bomb ever since. The response has even amazed the promotion experts who cooked it up.

Builds Good Will

What "Operation Snowflake" amounts to from the steel producer's standpoint is a logical refinement of the term, "Customer Service." Similar promotions heretofore have been more general—"Only steel can do so many jobs so well." This time, U. S. Steel is pinpointing one specific line of products produced by a specific

group of customers—the appliance makers.

U. S. Steel is likely to reap a lot of customer good will out of the promotion. Customer purchasing agents and top brass are inclined to feel kindly toward a supplier who lends a hand in selling their products. What's more, every appliance sold means more steel shipped.

What It Covers

It's considered likely that if "Operation Snowflake" is the whooping success it's expected to be, U. S. Steel will come up with other promotions—maybe even bigger ones—for other major consumers. A check on results will be made early next year.

The steel company's contribution to "White Christmas" include (1) the idea, (2) national magazine, trade paper, and TV promotion, (3) 100,000 display kits for customer appliance makers for distribution to retailers and utility companies, (4) publicity, and (5) free filmed commercials plugging the promotion theme, for use on TV stations.



SYMBOL representing U. S. Steel's "Operation Snowflake."

U. S. Steel has spent a lot of time and money on "Operation Snowflake." So will its customers and the utility companies. Also the appliance distributors and retailers.

Here's the imposing array of cooperative effort U. S. Steel is lining up for the big appliance push: (1) More than 100 appliance manufacturers; (2) 550 electric companies and 950 REA cooperatives; (3) 1000 gas companies; (4) 103 TV stations carrying U. S. Steel Hour, and (5) 1500 newspapers.

The campaign has been worked out in precise detail by the steel company and other participants—right down to the point where the customer walks into the store to the waiting arms of the salesman.

Where is all this going to lead? It could be that before long all steel producers will find themselves selling appliances, automobiles, kitchen utensils, and other consumer products made of steel. A few years ago this would be the last thing in the world to occur to steelmakers.

To U. S. Steel, at least, it makes sense.

Broaden Trade Info

Firms doing business abroad now have available to them a broad new series of government reports—"World Trade Information Service."

Recognizing that the overseas interests of business firms vary from the field of investment to the details of how to do business in various countries, Commerce Dept. is spreading its commercial intelligence reports into four new categories—economics, operations, statistical, and utilities.

SCRAP: Propose Export Curbs

Mills, dealers agree on compromise linking export quotas to steel production . . . See rhubarb on details . . . Plan takes effect Jan. 1 if okayed—By N. R. Regeimbal.

♦ TASK GROUP'S proposal that exports of iron and steel scrap be limited to a fixed proportion of steel production doesn't end the current friction between scrap users and suppliers. The rhubarb may flourish as a result.

The industry task group, consisting of steel company executives and scrap dealers, is asking Commerce Dept.'s Bureau of Foreign Commerce to work out de-

tails of the plan whereby as steel production rose, exports would be curtailed, and as production decreased, exports would be increased.

The compromise plan followed a meeting last week at which steel representatives sought a quota and scrap dealers demanded that exports continue uncontrolled except in time of a war emergency.

Scrap industry is "critically apprehensive" about the plan, although members say they will "go along with the principle." Tug of war will resume when the government sets a flexible quota scale—too low and the scrap dealers howl; too high and the steel mills complain.

Both groups are pressing for a look at the plan as soon as it is completed, and before it goes to Commerce Secretary Sinclair Weeks for approval. If approved, the plan would become effective Jan. 1, but would not cover exports to Canada or Mexico or apply to offshore procurement.

Scrap dealers are counting on strong support for a liberal export quota from State Dept. and the Foreign Operations Administration when the plan is presented for their approval by Mr. Weeks. The two agencies are expected to support a scrap industry contention that exported scrap is necessary to help European recovery keep up.

STEEL: What Mills Shipped in September

As Reported to the American Iron and Steel Institute

| STEEL PRODUCTS | SEPTEMBER | | | | | YEAR TO DATE | | | | |
|---|-----------|---------|-----------|-----------|------------------------|--------------|-----------|-----------|------------|------------------------|
| | Carbon | Alloy | Stainless | Total | Pct of Total Shipments | Carbon | Alloy | Stainless | Total | Pct of Total Shipments |
| Ingot..... | 10,717 | 9,383 | 2,074 | 22,174 | 0.5 | 137,910 | 99,003 | 14,481 | 251,394 | 0.5 |
| Blooms, slabs, billets, tube rounds, sheet bars, etc..... | 88,246 | 26,231 | 1,392 | 115,868 | 2.3 | 837,734 | 238,127 | 10,451 | 1,086,312 | 2.3 |
| Skelp..... | 13,714 | | | 13,714 | 0.3 | 92,988 | | | 92,988 | 0.2 |
| Wire rods..... | 65,364 | 1,270 | 328 | 66,962 | 1.3 | 560,584 | 9,823 | 3,272 | 573,679 | 1.2 |
| Structural shapes (heavy)..... | 343,861 | 2,400 | | 3,346,064 | 8.9 | 3,458,108 | 20,586 | 72 | 3,478,766 | 7.3 |
| Steel piling..... | 25,758 | 2 | | 25,760 | 0.5 | 290,724 | 2 | | 290,726 | 0.6 |
| Plates..... | 363,360 | 14,418 | 1,252 | 379,030 | 7.6 | 3,899,594 | 164,609 | 12,290 | 4,076,483 | 8.6 |
| Rails—standard..... | 57,383 | | | 57,383 | 1.1 | 981,597 | 112 | | 981,709 | 2.1 |
| Rails—all other..... | 5,598 | | | 5,598 | 0.1 | 66,943 | | | 66,943 | 0.1 |
| Joint bars..... | 2,568 | | | 2,568 | 0.1 | 57,420 | | | 57,420 | 0.1 |
| Tie plates..... | 13,712 | | | 13,712 | 0.3 | 211,298 | | | 211,298 | 0.5 |
| Track spikes..... | 3,292 | | | 3,292 | 0.1 | 56,542 | | | 56,542 | 0.1 |
| Wheels..... | 14,202 | 163 | | 14,365 | 0.3 | 147,765 | 1,020 | | 148,785 | 0.3 |
| Axles..... | 5,187 | | | 5,187 | 0.1 | 45,874 | 125 | | 45,999 | 0.1 |
| Bars—hot-rolled..... | 371,704 | 96,708 | 2,578 | 470,990 | 9.4 | 3,527,245 | 977,212 | 25,529 | 4,529,986 | 9.6 |
| Bars—reinforcing..... | 150,836 | | | 150,836 | 3.0 | 1,338,168 | | | 1,338,168 | 2.8 |
| Bars—cold-finished..... | 77,386 | 15,078 | 3,272 | 95,736 | 1.9 | 722,210 | 127,119 | 27,908 | 877,237 | 1.9 |
| Tool steel..... | 889 | 5,380 | | 6,269 | 0.1 | 9,565 | 53,369 | | 62,934 | 0.1 |
| Standard pipe..... | 213,121 | 3 | | 213,124 | 4.3 | 1,750,213 | 303 | 5 | 1,750,521 | 3.7 |
| Oil country goods..... | 148,044 | 31,449 | | 179,493 | 3.6 | 1,564,910 | 238,791 | | 1,803,701 | 3.8 |
| Line pipe..... | 224,834 | | | 224,834 | 4.5 | 2,168,643 | 16 | | 2,168,659 | 4.6 |
| Mechanical tubing..... | 40,291 | 13,498 | 279 | 54,068 | 1.1 | 371,215 | 127,058 | 2,963 | 501,236 | 1.0 |
| Pressure tubing..... | 17,396 | 3,541 | 1,141 | 22,078 | 0.4 | 166,805 | 36,567 | 13,278 | 216,650 | 0.5 |
| Wire—drawn..... | 198,402 | 2,591 | 1,862 | 202,855 | 4.0 | 1,734,996 | 22,493 | 18,863 | 1,771,352 | 3.7 |
| Wire—nails, staples..... | 84,748 | | 2 | 84,750 | 1.1 | 442,780 | | 4 | 442,784 | 0.9 |
| Wire—barbed, twisted..... | 8,649 | | | 8,649 | 0.2 | 114,663 | | | 114,663 | 0.3 |
| Wire—woven wire fence..... | 22,618 | | | 22,618 | 0.4 | 255,190 | | | 255,190 | 0.5 |
| Wire—bale ties..... | 2,791 | | | 2,791 | 0.1 | 45,742 | | | 45,742 | 0.1 |
| Blackplate..... | 75,872 | | | 75,872 | 1.5 | 531,457 | | | 531,457 | 1.1 |
| Tin & terneplate—hot dipped..... | 161,007 | | | 161,007 | 3.2 | 1,100,684 | | | 1,100,684 | 2.3 |
| Tinplate—electrolytic..... | 418,874 | | | 418,874 | 8.4 | 3,082,817 | | | 3,082,817 | 6.5 |
| Sheets—hot-rolled..... | 414,218 | 14,009 | 916 | 429,143 | 8.6 | 4,149,180 | 136,355 | 9,178 | 4,294,713 | 9.1 |
| Sheets—cold-rolled..... | 632,598 | 3,425 | 8,060 | 644,083 | 12.9 | 6,631,482 | 32,942 | 69,332 | 6,733,656 | 14.2 |
| Sheets—galvanized..... | 209,330 | 435 | | 209,765 | 4.2 | 1,751,599 | | | 1,751,599 | 3.7 |
| Sheets—all other coated..... | 12,835 | | | 12,835 | 0.2 | 125,717 | | | 125,717 | 0.3 |
| Sheets—enamel..... | 16,853 | | | 16,853 | 0.3 | 126,478 | | | 126,478 | 0.3 |
| Electrical sheets & strip..... | 6,354 | 39,116 | | 44,470 | 0.9 | 65,907 | 366,026 | | 433,933 | 0.9 |
| Strip—hot-rolled..... | 108,729 | 991 | 152 | 109,872 | 2.2 | 1,031,242 | 18,217 | 2,599 | 1,052,058 | 2.2 |
| Strip—cold-rolled..... | 89,172 | 1,027 | 12,481 | 102,680 | 2.0 | 792,824 | 8,748 | 116,838 | 918,410 | 1.9 |
| TOTAL SHIPMENTS (1954)..... | 4,688,313 | 280,117 | 35,792 | 5,004,222 | 100.0 | 44,446,813 | 2,661,307 | 322,053 | 47,430,173 | 100.0 |
| TOTAL PRIOR YEAR (1953)..... | 5,908,830 | 444,671 | 47,247 | 6,400,757 | | 58,627,848 | 4,740,267 | 480,399 | 61,848,324 | |

Would Conserve

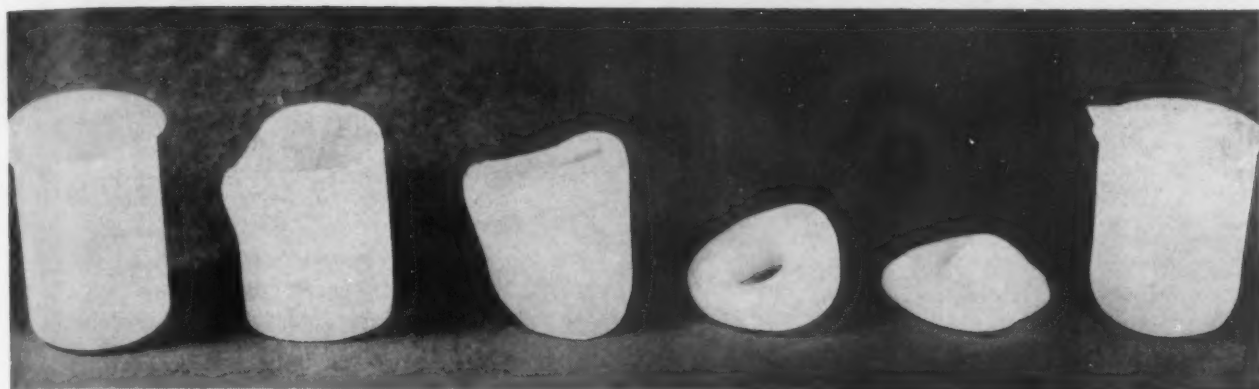
Should the scale set by the government seem too low to the scrap dealers, they will argue that it was set for price reasons—to keep the domestic price low by limiting the market—and therefore is completely outside the jurisdiction of the Bureau of Foreign Commerce. Steel firms retort that runaway prices, and the resulting inflation, must be checked by government action.

Steel representatives are also contending that scrap must be kept in this country to conserve a defense material. Scrap dealers reply that tonnage of purchased scrap used this year, 26.5 million tons including 1.5 million tons exported, is far below the 31 million tons used in 1953 and the 34 million tons consumed in 1952. They also point out that the government refused to stockpile scrap on the grounds that there is no shortage.

Finally, the scrap dealers contend that if a price ceiling is placed on scrap—by limiting the export market—it should be placed on other metallics also.

PLASTICS: Boost Heat Resistance

Atomic irradiation ups polyethylene range to 300°F . . . Costs are lower than for other high-temperature plastics . . . See many applications in food, chemical, electrical industries—By T. M. Rohan.



CONVENTIONAL polyethylene beaker at room temperature (extreme left), left to right: after 3 min at 300°F, after 6 min at 300°, after 8 min, after 10 min at 300°.

Extreme right, irradiated polyethylene beaker after 1 hour at 300°F showing improvement of heat resistance through atomic bombardment of polyethylene.

♦ PLASTICS industry and atomic bombardment scarcely seem likely bedfellows. But atomic bombardment of plastics is helping to eliminate a major industry problem—low heat resistance.

American Agile Co. of Cleveland will soon make its first shipment of irradiated polyethylene laboratory beakers, funnels and watch glass which will stand 300°F temperature without deformation.

Impact of the irradiation technique on the plastics industry was compared by Dr. J. A. Neumann, American Agile president, to alloying of steel and vulcanizing of rubber.

Try as Stainless Alternate

Previous ceiling temperature for the widely used polyethylene was about 160°F. Alternative was going into the higher priced halo polycarbon class which will withstand 350-400°F. This sells for about \$12 per lb compared to the new irradiated type which goes for \$3 to \$4 per lb.

Raising the temperature barrier with only about a 20 pct increase in price over conventional

polyethylene immediately raises a vast new area of applications for the industry, many of them replacing stainless steel and other metals. "Potential uses of irradiated fabrications in applications in the food, chemical and electrical industries are virtually unlimited," Dr. Neumann states.

Couldn't Be Cleaned

Vats made of the new high temperature plastic are already being tried experimentally in place of stainless steel type in one Cleveland area cannery. The 16-gal stainless vats, which were handled by personnel, had to be continually pounded out after being dropped. The dents presented a problem in thorough cleaning to avoid bacteria. Irradiated plastic vats, selling for about \$25 or 10 pct under the stainless, absorb the blows silently, do not dent and withstand boiling temperature without distortion.

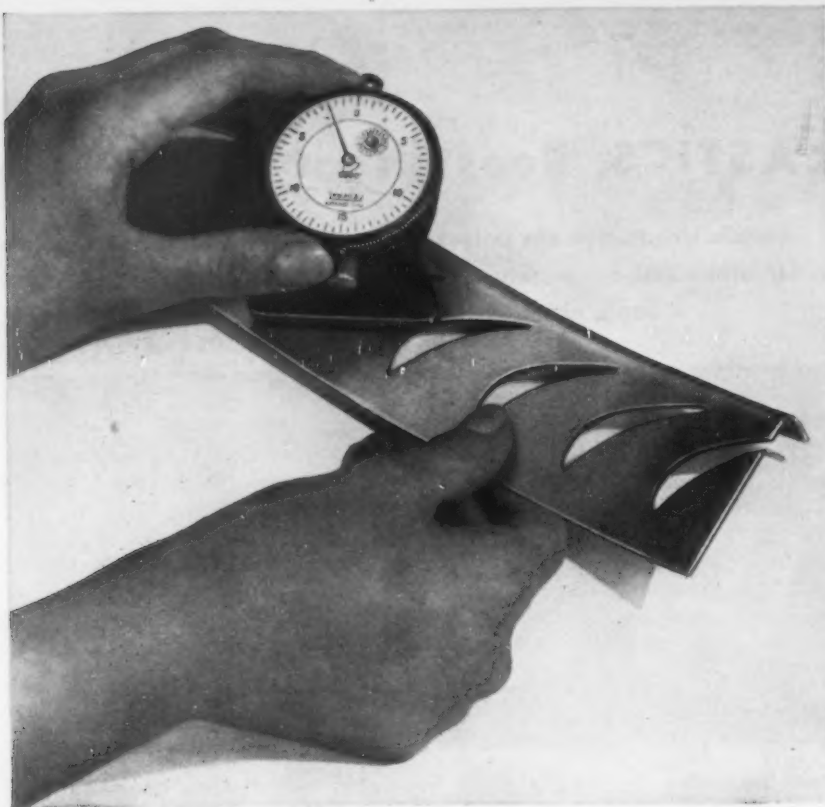
Additional major markets are seen in sheet, rod, tube, pipe and blocks for pressure molding. American Agile currently can fabricate by cutting and welding or pressure molding.

Irradiation is done by special methods worked out with High Voltage Engineering Corp., Cambridge, Mass. A 2-million volt Van de Graaff electron accelerator is used. Since irradiation must be done after fabrication and involves these special techniques, American Agile's major interest naturally is concerned with the sale of finished products.

Since laboratories and hospitals are American Agile's current major customers, first regular production items are going to this field as beakers, funnels, etc. New high temperature types significantly will be labelled green and previous low temperature types red.

Discovered By Accident

Plastics got into atomic bombardment by the back door at Oak Ridge Laboratories and in England, where they were developed for use as modifiers or resistors in shielding, much as resistors in an electric circuit. American Agile 4 years ago furnished sheets for this use at Oak Ridge and it was found they could be decontaminated in an hour or so



Indicating Gages provide a quick, inexpensive method of checking workpieces . . . Here, a Federal gage checks minimum radius distance between shroud ring slots for a jet engine.

When all is said and done

WHICH GAGE MANUFACTURER has consistently produced the most complete line of modern gages?

Ever since Federal offered its first Dial Indicator, 37 years ago, this company has consistently lead the way in improvements, new instruments, and new methods of gaging. First to realize the value of Quality Control by Statistics, Federal was also first to promote its use by educating manufacturers all over the country in its application.

On the other hand, Federal has consistently weighed new ideas and rejected hundreds that would not

stand up to requirements which proves that not all new ideas are practical ideas.

Federal concentrates on the design and manufacture of dimensional gages — not only a wide variety of Indicator Gages but also the most advanced type of Air Gages, Electric, and Electronic Gages — for continuous measuring, automatic sorting, and automatic dimensional control of parts produced on machine tools.

Our new booklet "A Management Blind Spot" reveals unappreciated shop situations and tells how they can be corrected. For your copy, write

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RESEARCH

compared to the 2-3 days needed in decontaminating most stainless steels.

In attempting to analyze this, it was found overexposure caused brittleness. This launched the search for other physical property changes wrought and resulted in discovery of improvement in heat resistance. American Agile and High Voltage then worked out the irradiation technique which is highly critical and dependent on size, contours, structure and other factors.

Resists Corrosion

In addition to temperature resistance, irradiation also increases corrosion resistance since the plastic becomes less soluble in many liquids. Parts are also easily fabricated while costlier halo-polycarbons, also high temperature resistant, must be made by pressure molding.

The electron accelerator currently used will cover a 15-in. sweep on scanning and complete irradiation is accomplished in a few seconds under closely controlled dosages.

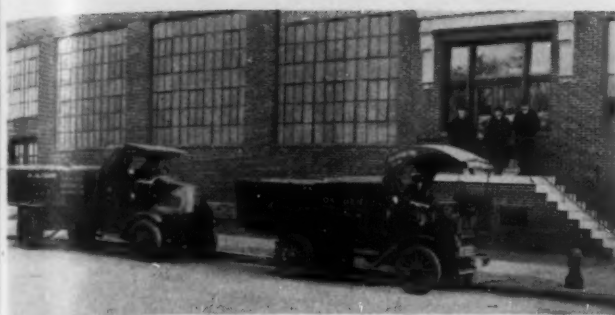
Stops Stress Cracking

It is possible that radio isotopes, currently readily available, can also be used, although control is more difficult and reaction cannot be stopped at will. There is no radioactivity connected with the present system.

Stress cracking, one of the drawbacks to conventional polyethylene, also seems to be eliminated by irradiation. The effect is roughly comparable to stress-relieving in metal. Samples in experimental use for months have as yet exhibited no signs of cracking from stress.



"Funny how most of our withdrawal clerks remain bachelors."



AIRCO'S oldest oxygen plant bows out as newest unit starts producing in heart of Delaware Valley.

Oxygen:

**Airco's Riverton, N. J., plant
rated at 110 tons per day.**

This week Air Reduction Co. is celebrating completion of its first cycle in the healthy "young" oxygen industry.

Airco will hold openhouse this Saturday to show off its new ultra-modern oxygen plant at Riverton, N. J. Located in the heart of the Delaware Valley "Gold Coast," the new plant is designed to serve the rapidly expanding industry of the area.

Opening of the Riverton plant follows closely the closing of Airco's first oxygen plant just 9 miles away in Philadelphia.

Comparison of Airco's oldest and newest plants gives a good picture of the progress that has been made in production, distribution, and use of industrial gases during the past 40 years. These plants are contrasted in the photos above.

The picture of Airco's first plant was taken in the early twenties, although the plant was built in

1916. It had production capacity of 3 to 4 tons of oxygen per day, compared to 110 tons per day for the new plant which replaces it.

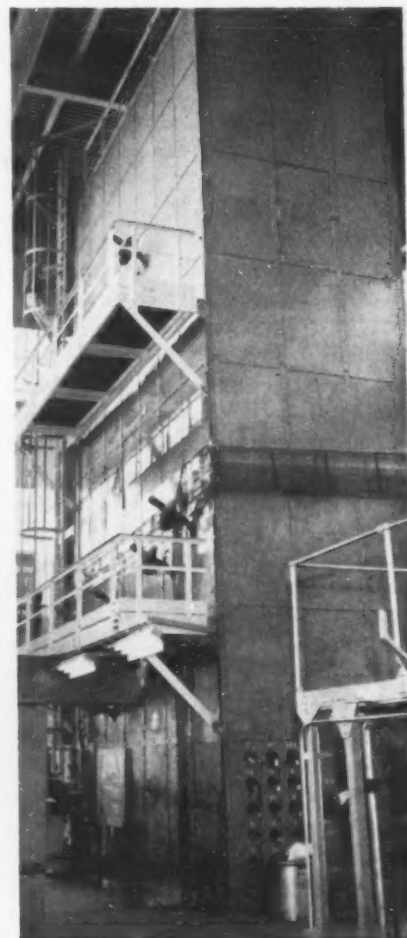
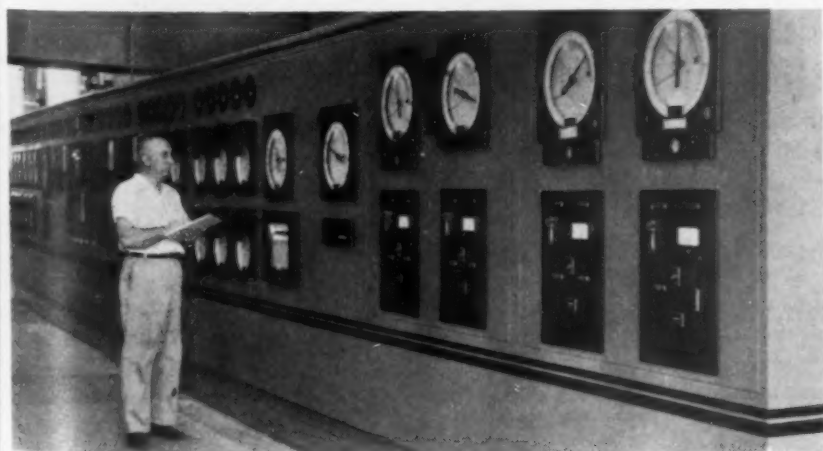
The photos provide clear illustration of progress in handling and distributing the liquid oxygen to industry. In addition to oxygen, which was only 99 pct pure in the early days, Airco's first plant produced small amounts of low purity nitrogen. All gas was distributed in cylinders. In those days oxygen was used primarily for maintenance welding and cutting.

Airco's new plant, 1 of 70 it has located strategically near industrial users, has two producing units. Each unit is capable of turning out 55 tons of liquid oxygen per day; total plant capacity is 70 million cu ft per month.

Each unit has a control panel which houses automatic control and analysis equipment. The operator can tell temperatures, pressures, flows and analyses of the various gases throughout the manufacturing process. An automatic alarm system notifies the operator the moment any phase of the operation is off control.

A complete array of distribution equipment, including special trailers, tank trucks, and railroad tank cars, assures speedy delivery to Delaware Valley customers. Modern handling also makes it possible to transport gases economically to more distant points, hence the trend toward larger capacity gas producing plants.

In addition to oxygen, products of the new Riverton plant include high purity nitrogen and argon, as well as some of the rare gases—neon, krypton, and xenon.



AUTOMATIC control panel above operates one of two oxygen producing units shown at right.

E. N. Gosselin

Sees Tank Future Expanding

Fabricator sees 1954 industrial tank volume surpassing 1953 . . . Future holds steadily growing demand from chemical, oil industries . . . New metals, methods will meet needs.

Q. When the smoke has cleared, how do you feel the industrial tank fabricator will regard 1954, as compared with 1953?

A. Construction activity continues to hold up very well all along the line. Likewise, the fabrication of tanks for industrial building and other uses in 1954 will run ahead of 1953 volume. However, competition is increasing and consequently the margin of profit is lower.

Q. Will the chemical industry continue to bulk as large in the erection of storage and processing facilities as it has for the past two or three years?

A. Through intensive research the chemical industry will undoubtedly continue to play an important part in the nation's overall economy. Population growth requires more industrial materials and consumer items. This, in turn, requires more storage and processing facilities.

Q. It has been said that petroleum distribution systems have passed their building peak, that storage needs from this quarter will begin to slow. Do you agree?

A. There will, of course, be slow periods experienced in this industry as well as in other industries. However, we do not believe that the petroleum distribution system has passed its building peak. The continued development of new homes and communities, additional highways and more automobiles and airplanes will continue to re-

quire new supply points for petroleum product distribution.

Q. LP gas and the petrochemicals have moved strongly in recent years. Do you expect this movement to continue at its present pace over the next year?

A. Leaders in the petrochemicals industry, such as Phillips Petroleum, predict that the industry will expand many fold in the coming years. We believe that these products will continue at their present pace over the next year.

Q. Do you expect to see substantial developments in the use of new metals in the tank field soon?

A. New metals developed in recent years have proved to be most useful in the machine tool and aircraft industry but have not materially changed the plate products used in the manufacture of tanks. However, the problem of corrosion continues to be of concern to all industry and new alloys will perhaps be a partial answer to this problem.

Q. Tank fabrication problems have developed a number of new welding techniques. What developments do you expect in the immediate future?

A. Industry is continually carrying on a welding research for the development of new techniques. Recent announcements include development in automatic submerged arc welding of joints for field erected structures. Greater use of new metals give us new problems



**E. N. Gosselin, Pres.
Graver Tank & Mfg. Co., Inc.
East Chicago, Ind.**

which, in turn, will have to be overcome with new welding methods.

Q. What markets will tank fabricators watch most closely in the next few years?

A. Equipment for petroleum, petrochemical, chemical, food and atomic energy will, no doubt, continue to be the major markets for tank fabricators to watch.

Q. Do you expect any pickup in defense installations of tank facilities in the near future?

A. Defense installations are not a major market for plate fabricators except during periods of all-out war.

Q. On the other hand, do you believe cuts in expenditures for defense have leveled off, or that they will fall further?

A. Since we are not in a position to predict the expenditures for defense purposes, we prefer to pass up this question.

Q. Do you believe consumption of steel plate will equal first half level in second half 1954?

A. We do believe consumption of steel plate in the latter part of 1954 and early 1955 will surpass the first half 1954 level.

HEARING: Tests Forestall Trouble

Audiometer is key weapon in fight to curb industrial hearing loss . . . Regular test program enables management to check ear damage before it starts . . . Prevent claims, lawsuits—By K. W. Bennett.

♦ **INDUSTRIAL** hearing loss—a nebulous phrase in the past—became a tangled legal problem last year. In 1954 industry is paying more heed to this term than ever before. Auditory testing equipment sales are the indicator.

Chief item of equipment is the audiometer, a small electronic device for measuring acuity of the human ear. Audiometers are used to check hearing of new employee or detect loss of normal hearing in old-line employees.

Executives within the comparatively small audiometer industry estimate their 1954 equipment sales will be 20 pct over 1953, found that 1953 was 10 pct over 1952—and recall that 1952 was the first year in which there was any real interest in the testing of worker's hearing.

Courts Spur Sales

Audiometers are not new. Maico, Minneapolis producer of the sets, was formed to market auditory testing equipment back in 1937. Though early markets were mainly clinics and medical centers, a few industrial firms have had hearing test programs for some time. Lockheed and Allis-Chalmers are examples in point. A random choice from the list of present day audiometer users would include producers like Ford Motor Co., U. S. Steel, du Pont, American Can, Columbia Broadcasting System, General Electric, Alcoa, Pan American Airways and International Harvester.

Sharp sales increase of 1953 and 1954 was triggered partially by a Wisconsin court decision last year awarding compensation to a worker who entered suit for a hearing loss. New market includes a growing segment of smaller firms as well as industrial giants (a 100-man lum-

ber mill was one recent buyer). Demand is expected to move into firms below the 100 employee level in the not distant future.

Audiometers range in price from about \$350 up to \$700, costing no more, for example, than the plant's movie camera. In dollars saved audiometers have proved their value in a number of cases. At Allis-Chalmers, for instance, each new employee gets a thorough audiometer test, administered by a plant nurse. A permanent record of hearing condition at the time of employment is kept on file. Lockheed does somewhat the same thing. In the near future Lockheed will publish the results of tests on 15,000 persons in 80 different jobs, is currently reported testing employees going into high noise level areas, about 50 pct of the total work force. Cost is 35 to 80¢ per employee tested.

Hearing experts know that the cycles, or pitch of sounds, can be more important from a safety aspect than mere volume, the decibel rating of a sound. For instance, the

normal range of the human voice is from 500 to 3000 cycles, although some experts say the speech range might run to 4000 cycles and down to 250.

When a man loses 30 decibels of volume in hearing a 1000 cycle tone, he is a pretty good prospect for a hearing aid salesman. However, his hearing will probably begin dropping off first at the 4000 cycle level, a loss in his hearing that, unless he is an acute hi-fi fan, he'll not be able to detect. The audiometer, however, can detect this high-level hearing loss. It may be time to transfer the employee into a plant area with a lower noise level.

Unions Keep Tabs

Hearing specialists point out that past cases involving damage suits for loss of hearing aren't conclusive evidence that any hearing loss can be grounds for a suit. On the other hand, most state laws are loosely written in their definition of hearing loss, can cause trouble where no real problem exists.

The unions are well aware of the possibilities. A publication, "Occupational Deafness, Real or Imaginary" bylined by Michael Wood, president of Local 247 of the International Brotherhood of Blacksmiths, Drop Forgers and Helpers, offers statements from medical men that a prolonged 85-decibel noise level or higher can produce hearing loss. Pamphlet lists 24 machines and tools, ranging from a punch press and circular saws to a nail-making machine that are above the danger level.

Although the pamphlet neglects to point out that a prolonged sound of 105 decibels at a low frequency will probably have little or no effect on hearing, it does illustrate the active interest unions are tak-





EVEN if the cost per piece is actually higher, if the gears you use in your product are precision-engineered by Perkins, the *heart* of your product — its power transmission system — will function more efficiently. This factor is especially valuable when automation enters the production picture. In that case, *lack of functional precision*, could easily result in speeding up the manufacture of faulty products — a truly horrendous possibility.

Figured on the basis of trouble-free performance alone, the ultimate cost of Perkins Gears is considerably lower than their initial cost-per-piece would indicate. Best of all, even the initial cost of Perkins

custom-made Gears may be competitive. And that is something you can quickly and easily determine by asking us to quote on your requirements.

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PERKINS MACHINE & GEAR CO.
WEST SPRINGFIELD, MASSACHUSETTS

ing in industrial noise and hearing loss compensation. This 30-page booklet is now used by one audiometer producer in selling employers.

Two insurance companies, Liberty Mutual and Employers' Mutual are reportedly now making use of audiometers and Marquette University is reported to have begun a course in audiometer operation for Milwaukee-area industrial employees. While Audivox, Sonotone and Maico have had this field pretty much to themselves, Beltone will soon market an 11-lb portable set that can test up to 40 people simultaneously.

And audiometer use is following a growing trend already in industrial medicine. When three, four, or five small firms band together to hire a plant doctor and nurse that none of them could individually afford, they are now doing the same thing in their purchase of an audiometer and training of personnel to operate it.

Streamline Activities

Health, safety, and coal mine inspection work of the U. S. Bureau of Mines will be handled separately from other activities of the agency beginning about Jan. 1.

The Div. of Health will include a branch of health research located at Pittsburgh, where laboratory facilities are available. A Washington function of the Div. of Safety will be the operation of a branch of accident analyses.

Also being established by the Bureau are 8 district and 12 sub-district health and safety offices.



"And this, for want of a better name, we call the music room."

STEEL: Balance Warehouse Inventories

Buying from mills catches up with sales rate . . . Was trailing by 15 pct . . . Warehousemen see return to 4-month inventory turnovers . . . Spot shortages bring back quantity buyers—By K. W. Bennett.

◆ **WAREHOUSE** purchases of steel are moving up. After a year-long dragging of heels, the industry is reporting the inventory overload of early 1954 as reduced to just about the point at which it belongs.

A fairly conservative estimate for the industry would indicate warehouse buying of mill steel during the first half of 1954 running about 15 pct behind the rate at which warehouses were selling. The Korean days of high inventory, high turnover were ended. And warehousemen, working to reduce cost in a competitive market, were moving to better their 1.5 times per year inventory turnover—were beginning to shoot for at least three times a year turnover of total stock, more if possible.

Report Adjustment Complete

Reports suggest that October marked the end of the adjustment period for an important segment of the industry. Receipts from the mills began, around the middle of the month, to equal outgoing customer orders. From here on warehouse buying will begin to reflect actual warehouse selling volume. Also, it's now possible to figure that a 4-month inventory, allowing three stock changes per year, has been reached.

Opinion varies as to the warehouse outlook for December, and even late November. There is a fairly strong feeling that buying will level off in November and carry at a steady pace through December despite the normal pre-inventory seasonal drop that occurs at the year's end.

Whatever the case, warehouse purchasing will advance directly with sales of most grades. There have already been evidences of a pinch in cold- and hot-rolled sheet,

the latter item regarded by mills as a loose item little more than a month ago. Strip, a hot potato earlier this year, wasn't regarded with great enthusiasm for inventory purposes, is now moving up and is expected to advance further.

A spurt in warehouse purchasing means that an important portion of the mills' market is beginning to lengthen its stride. The warehouse industry has been absorbing about 20 pct of total steel mill output in past years but fell to 18 pct this year when total steel tonnages shipped from the mills fell to 76.5 pct of the figure for last year (through August). Warehouse shipments dropped to an overall industry figure of about 62 pct of '53. Despite peaks in March and June of this year that aroused considerable hope, the total industry figure hasn't pulled up strongly.

While it isn't expected to change in any zooming curve (at least one sales chief figures the advance is good for only about five percentage points), warehouse buying from the mill is no longer curbed by the inventory specter. Mill purchasing of flat-rolled products (including plate on the West Coast) is based on a probable shortage by December.

The infighting is putting that tired gray-market sheet to the wall. Material offered at below mill prices is still sinking but is in small enough volume at present to bring a doubtful customer back to a legitimate warehouse, which probably had a salesman in his waiting room anyway. While increasing mill delivery dates (one group can't get hot-rolled sheet from their mill supplier in less than six weeks), may encourage holders of steel of clouded parentage, a good number want out. At least one warehouse official suggests that job slitting is on the wane. With strip moving up, mills doing their own slitting, and a number of sheet customers now equipped to slit in their own plants, outlook is not bright.

Curtail Inventory Cutting

Warehouse inventory reductions were originally scheduled to go through December or at least through the end of November. One major chain worked out such a reduction schedule as late as last June. Reduction schedules are now being cancelled two months early. If the pickup has been rapid enough to beat these schedules, it's quite probable that late-fall ad-

Fabricated Structural Steel Contracts, Shipments, Backlog

| | Estimated Net Tons | | |
|------------------|--------------------|-----------|--------------|
| CONTRACTS CLOSED | 1954 | 1953 | Avg. 1947-50 |
| September | 206,606 | 217,600 | 215,870 |
| Year to Date | 1,904,003 | 2,238,194 | 1,744,468 |
| SHIPMENTS | | | |
| September | 265,388 | 255,599 | 197,331 |
| Year to Date | 2,424,841 | 2,297,482 | 1,689,123 |
| BACKLOG | 1,328,604 | 2,040,534 | 1,321,835 |

Source: American Institute of Steel Construction



Specialists in Metal-Cleaning Products



C. O. Moorhead (left), Gen. Mgr., MCM Machine Works, checks over cleaning operation with Supt. Jack W. Erb, and Wallace D. Bobb, Wyandotte Jobber Representative.

"With W.L.G.—we remove heavy soils and paint in one operation!"

WHEN OIL-DRILLING equipment comes in for repair at the MCM Machine Works, Oklahoma City, Okla., it's crusted with heavy oils, grease, paraffin and paint. But one soaking in Wyandotte W.L.G.* solution quickly removes these stubborn soils. Even the paint—usually several layers thick—strips clean!

Says C. O. Moorhead, general manager, "We used to steam-clean equipment before repairing it, but soak-cleaning with W.L.G. gives us a better job at lower cost. We save on labor and material, too."

W.L.G. is a heavy-duty, dust-free metal cleaner with long solu-

tion life, high detergency and no disagreeable odor. It can cut costs and improve results on *many* jobs—cleaning prior to vitreous enameling; barrel and soak cleaning in plating lines; cleaning in immersion phosphating lines prior to painting.

For a demonstration or sample of W.L.G., contact your Wyandotte representative or jobber. His broad experience and Wyandotte's complete line of specialized metal cleaners will help solve *your* metal-cleaning problems. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Also Los Nietos, California.*

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PRODUCTION

vance in warehouse business will further surprise planners in moving up at a rate unexpected in view of customer buying thus far this year.

For instance, mill schedules are moving out and a growing number of steel consumers with low inventories are requesting faster delivery. If this continues, warehouses will again receive some of the normal mill business that came their way in 1952 and 1953. Thus far it's been good enough for one sales chief to point out that September was his second best month this year, another to indicate it's his best since last November.

Setasides:

Defense aluminum needs rise for first quarter.

Defense and atomic energy requirements for steel and copper in the first quarter of 1955 are below the current quarter, but aluminum setasides are 10 pct higher.

Office of Defense Mobilization says steel allotments for producers of prime military goods are 8 pct below the current quarter, while requirements for copper are 2 pct less. All new allotments are considerably below first quarter requirements in 1954.

Increased aluminum requirements do not signal an increased military program, ODM says, but reflect variances in inventories and changes in materials specifications and model revisions.

Additional allotments will also be made for producers of civilian-type products incorporated in military end items.

Allotments for defense and atomic energy ("A") products for the first quarter of next year compared with the current quarter and the first quarter of 1954 in net tons are:

| | First Quarter 1955 | Fourth Quarter 1954 |
|---------------------------------|--------------------|---------------------|
| Aluminum..... | 58,743 | 53,364 |
| Copper & Copper Base Alloys.... | 35,246 | 36,003 |
| Steel..... | 601,323 | 651,270 |

RAILROADS: Still in Time of Troubles

General business upturn won't benefit roads, AAR predicts . . . Call for "sound public policies" to aid traffic, earnings . . . Revenues, buying sag . . . Car, locomotive backlogs, orders off badly.

♦ RAILROAD men are showing a reluctance to believe that a general upswing in U. S. business would necessarily mean a return to healthy economic conditions in the rail transportation field.

Called for as necessities in improving railroad traffic and earnings are "sound public policies" related to competitive forms of transportation, according to J. Elmer Monroe, vice-president of the Assn. of American Railroads.

Mr. Monroe, who also directs the AAR Bureau of Railway Economics, blames many of the ailments of the railroad industry on the public's greater use of "subsidized" competitive carriers.

Revenues Decline

In the first 8 months of this year, Mr. Monroe says, net railway operating income was 32.8 pct lower than that in the corresponding months of 1953, and net income after fixed charges dropped by 41 pct.

In the same period, freight ton-miles were nearly 12 pct lower, and total operating revenues declined by 13.7 pct. Sagging revenues are producing a "very pronounced" effect on financial resources and spending budgets of the rail carriers, Mr. Monroe states.

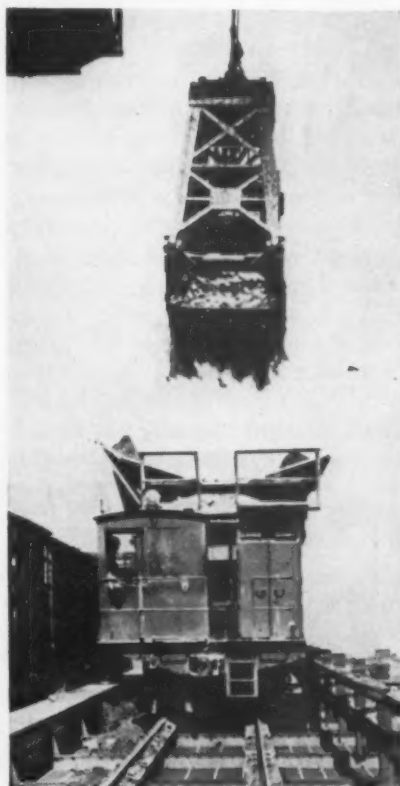
Upturn Won't Help

Many analysts and forecasters, he says, see signs of a general business upturn in the coming year. He maintains, though, that this economic climb alone will not give the railroads the prosperous conditions they would like.

And, of course, how busy the railroads are determines how much they have to purchase and how much they can afford to buy. Producers of rails, track acces-

sories, plate, fasteners and structurals are feeling these effects in reduced demand as are founders who depend on railroad business.

Purchasing activities of the nation's railroads continue in a slump and show little signs of an important pickup in the months ahead. Statistics of the AAR and the Railway Car Institute show that, although deliveries of cars increased in September, orders for new cars and the backlog of undelivered cars continued to decline.



BIG BITE is taken by this 4-rope clamshell bucket, largest of its type, at Youngstown Sheet & Tube Indiana Harbor Works. Bucket capacity is 22.5 tons of ore per grab. Manufactured by Blaw-Knox Co., it operates from a Heyl & Paterson bridge.

Deliveries of new freight cars in September totaled 2566, compared with 2297 in August and 5706 a year earlier. Orders for 2396 new cars were placed in September, which brought the backlog of undelivered cars to 11,993 on Oct. 1, compared with 13,013 a month earlier.

Primary railroads are placing new locomotive units in service at a rate almost 50 pct below that of a year ago. Latest AAR report shows that in the first 9 months of this year, 953 new units were delivered, compared with 1667 for the same period in 1953 which certainly could not have been termed a good year.

All but 14 of the new units delivered this year were diesel-electric. The others were gas turbine-electric. During September, 75 new locomotives were placed in service, 43 less than in September, 1953.

As of Oct. 1, class I railroads had 115 new units on order, compared with 548 at the same time in 1953.

Grant Writeoffs

Expanded facilities for producing diesel locomotives, freight cars, steel plate and steel sheet are granted certificates for fast tax amortization for 33 projects totaling \$12.7 million. Included were:

Bethlehem Steel Co., 50 pct of \$1,950,000 for facilities to produce steel plate at Sparrows Point; Jones & Laughlin Steel Corp., 40 pct of \$638,228 for a continuous strip mill at Cleveland; Southern Pacific Co., 55 pct of \$2,422,427 for facilities to produce diesel locomotives at San Francisco, and Pennsylvania Railroad Co., 85 pct of \$2,120,000 to produce freight cars at Philadelphia.

Surplus:

Auction U. S. goods in "operation clean-sweep."

Mountains of so-called surplus goods—from adbrasives to zinc—are being auctioned off by the Defense Dept. About four sales a month are being held in all parts of the country by private auctioneers, and will reach their peak next year.

The government is holding the sales as part of "operation clean-sweep," designed to clean its warehouses of obsolete, worn out or otherwise useless material. So far, only one-third of total surplus sales have been by auction, the rest going on under the sealed bid method. The sales resemble old-time country fairs in some cases with hot dogs, balloons and banners.

Some businessmen, as well as wholesalers, scrap dealers and surplus store operators, are following the sales closely and picking up bargains, a defense aide reports.

Defense officials and the Commerce Dept. are working together to minimize the impact of the sales on business. In several instances, goods have been withdrawn from the sales, sold in other areas or their sale delayed where it was feared an area or an industry would be damaged. Officials will try to help out a group, but say that in most instances they can't try to protect an individual businessman.

Plan Supertankers

Bids on construction of two new supertankers are being requested from private shipbuilders by Esso Shipping Co., New York, which plans to spend up to \$17 million for the work.

Each vessel is to be of 35,550 deadweight tons, with an overall length of 690 ft and capable of maintaining a speed of better than 16 knots at 80 pct of their rated shaft hp.

Esso will trade in, for government credit, five wartime T2 tank-

ers as part of the building plan. This is the first transaction to be performed under the new "tanker trade-in and build" authority granted by Congress to create a national defense reserve of tankers and stimulate new tanker construction.

Maritime Administrator Rothchild says the government will pay about \$5 million to buy the five usable tankers for the reserve fleet.

Atoms:

Plan nuclear power for ships and airplanes.

Air Force will build a \$10 million research and development laboratory for the Pratt & Whitney Aircraft Div. of the United Aircraft Corp. to use in designing a nuclear-powered aircraft engine.

Air Force engineers are now seeking a site for the building within a 50-mile radius of Pratt & Whitney's East Hartford, Conn. plant. Congress provided \$5.7 million for construction, and equipment to be added later will run the cost to \$10 million.

Pratt & Whitney is working under Air Force and Atomic Energy Commission contracts to develop a workable atomic aircraft engine. The research center will be owned by the government, but loaned to the firm, an Air Force spokesman says. There are also indefinite plans to expand the center later.

And atomic power is emerging as a definite threat to other fuels as a means of propelling ships. Small, efficient A-power plants are now feasible. Within 5 years, the

U. S. Navy expects to have in active service the first atomic-powered ship, which will be the forerunner of an entire fleet of fighting ships powered by atomic energy.

Tests conducted on the performance of the Nautilus—the first atomic-powered submarine—indicate that A-power is no longer in the "men from Mars" stage. It can be applied efficiently as a maritime fuel.

By 1960, the Navy expects to show the way to practical use of atomic power in all its combat vessels—aircraft carriers, battleships, destroyers—and possibly some service vessels like transports.

QM Has New Test Plan

Greater reliance is placed on civilian tests of common commercial-type items by Army Quartermaster Corps, which has a new program for reducing its acceptance testing activities.

This plan requires that contractors selling such items to the Quartermaster Corps make inspection tests at their own plants or at commercially-run facilities. Formerly, this work was handled at the QM General Testing Laboratory, Philadelphia.

The new arrangement, in which contractors will present compliance certificates backed by test results, will reduce the military role to check-testing on a sample basis. It is expected to speed up procurement of ordinary commercial items.

Contracts Reported

Including description, quantity, dollar values, contractor and address. Italics indicate small business representative.

Shell, HE 280 MM T122, \$2,016,336, Auto Specialties Mfg. Co., Inc., St. Joseph, Mich.

Electric minesweeping winch, 13, \$258,678, Hyde Windlass Co., Bath, Maine.

Minesweeping cranes, 66, \$239,102, Wellin Davit and Boat Div., Perth Amboy, N. J.

Distilling unit, 4, \$470,340, Gleaver Brooks Co., Milwaukee, Wis.

Battery, submarine, 2, \$619,200, The Electric Storage Battery Co., Phila., Pa. *J. W. Boyes.*

Light trucks, 358 ea, \$416,411, Ford Motor Co., Washington, D. C.

Facilities for prod. of B-52 acft, \$751,400, Boeing Airplane Co., Wichita, Kan.

Aircraft, 200, \$4,301,492, Beech Aft Corp., Wichita, Kan. *J. F. Allen.*

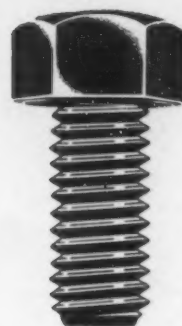
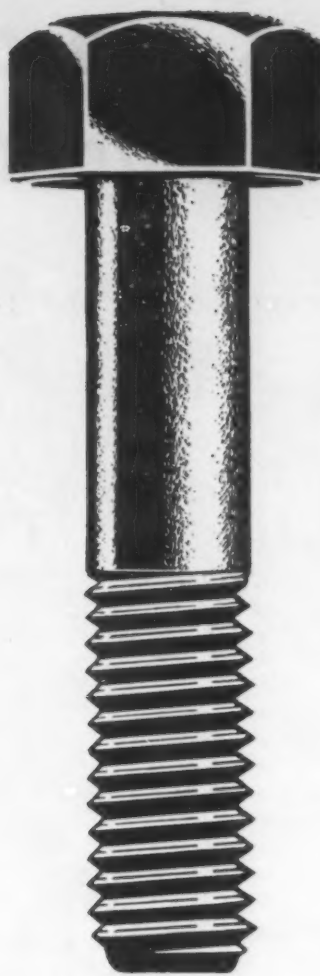
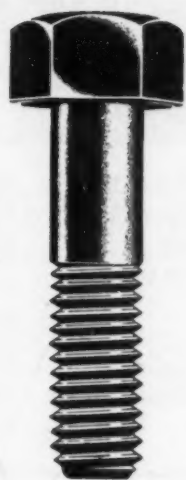
F-104 acft, \$11,000,000, Lockheed Aft Corp., Burbank, Calif. *J. S. Card.*

Jet tanker acft, \$25,000,000, Boeing Airplane Co., Seattle, Wash.

MB-2 autopilot sys, 258 ea, \$3,001,682, Lear Inc., Grand Rapids, Mich.



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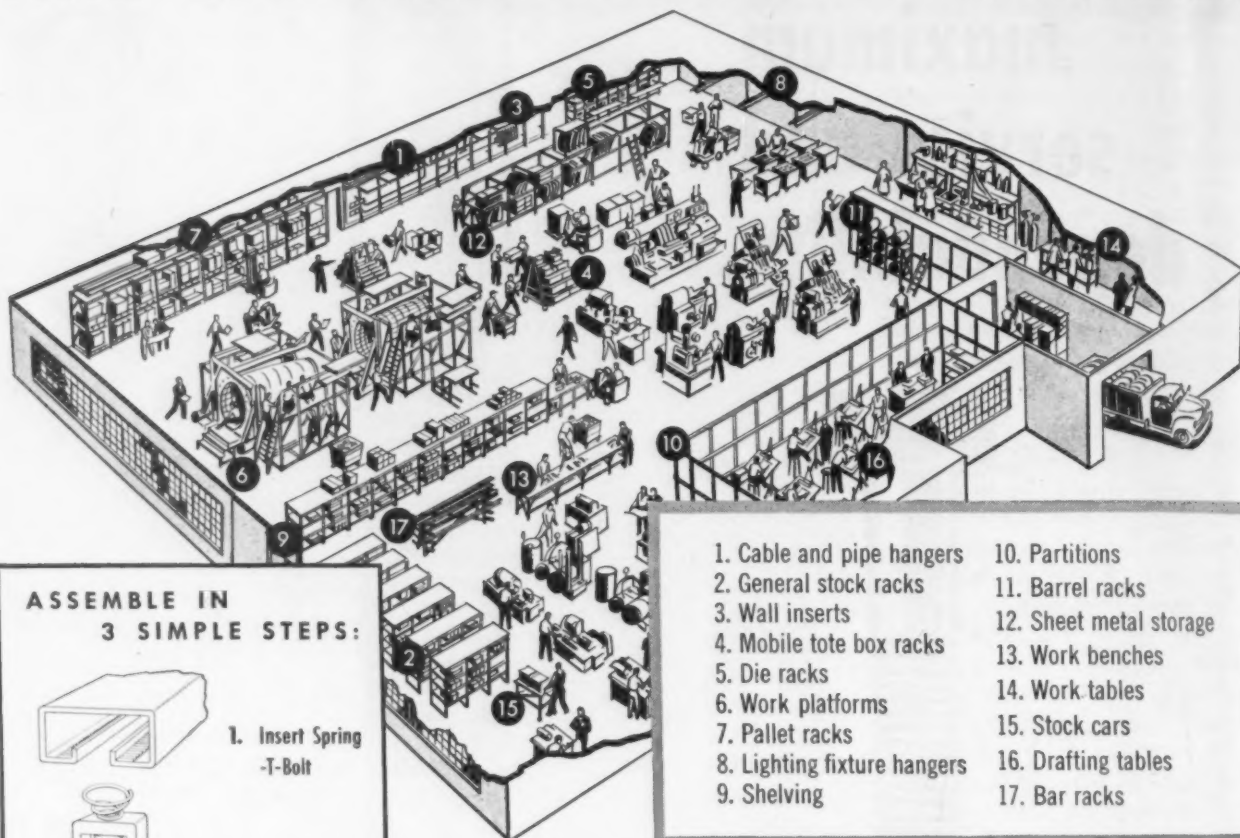
**REPUBLIC
BOLTS AND NUTS**



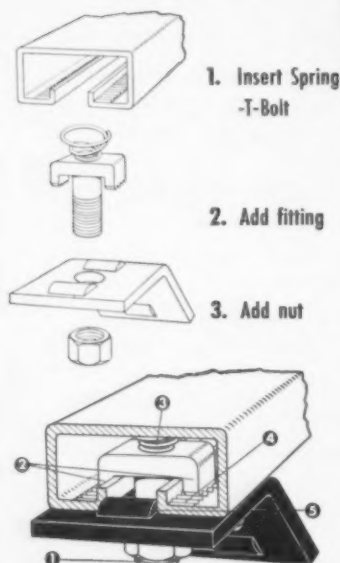
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November 11, 1954

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INDUSTRIAL BRIEFS

Elected . . . American Institute of Steel Construction elected Earl V. Grover as its president at its annual convention in White Sulphur Springs, W. Va. Mr. Grover is president of Apex Steel Corp., Ltd., Los Angeles.

Formed . . . Borg-Warner Corp. has formed a new manufacturing subsidiary, Morse Chain of Canada, Ltd. Ground has been broken for the new plant at Simcoe, Ont.

Elected . . . American Welding Society elected as its president, Joseph H. Humberstone. He is president of Air Reduction Sales Co., Inc., New York.

Office Opened . . . Reliance Electric & Engineering Co. has opened a direct factory sales office in Milwaukee at 5856 N. Port Washington Rd. Vernon S. Barnes is branch manager.

Scholarship . . . Illinois Institute of Technology, Chicago, established a \$1000 annual scholarship to further the education of engineering students enrolled at the school.

Hear Ye . . . Operations at Jones & Laughlin Steel Corp.'s new warehouse and container plant in Lancaster, Pa., are scheduled to get underway Dec. 1.

Contract . . . Garrett Corp.'s AiResearch Aviation Service Co. Div. has been awarded a contract for conversion of four Sikorsky S-55 helicopters to passenger-carrying aircraft by Los Angeles Airways, Inc.

Almost Ready . . . Enamelstrip Corp.'s new plant at Allentown, Pa., is scheduled for occupancy on Jan. 1. The plant is part of the company's million dollar expansion program.

On Tour . . . Isaac F. Kinnard, manager of engineering, and Mark A. Princi, manager of Measurements Laboratory, General Electric Co., Instrument Dept., West Lynn, Mass., have left on a 2-month tour of Europe to gain a better understanding of measurement technology in European industry.

New Prexy . . . Foundry Equipment Manufacturers Assn., Inc., elected as its president William B. Wallis, who is president of Pittsburgh Lectromelt Furnace Corp.

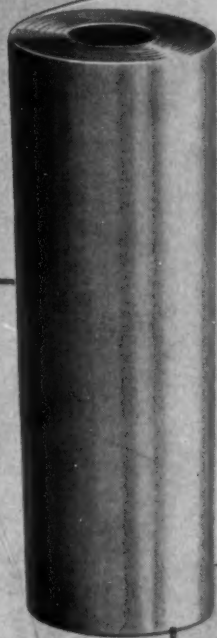
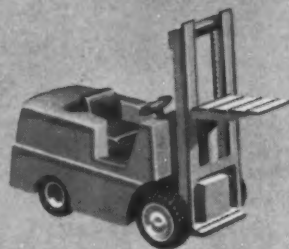
Rep Appointed . . . Standard Transformer Co., Warren, Ohio, appointed J. L. Howarth Co., Birmingham, as its exclusive representative in the states of Alabama and Georgia.

Dividend . . . Alan Wood Steel Co. declared a dividend of 5 pct on its outstanding common stock, payable Nov. 20 to stockholders of record Nov. 5.

Chicago Office . . . Berry Div. of Oliver Iron & Steel Corp. has opened a new sales and engineering office in Chicago at 4227 W. 43rd St. W. L. Denniston is district sales engineer.

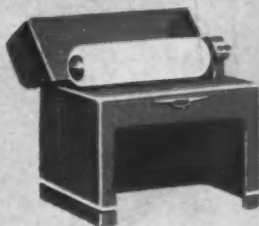
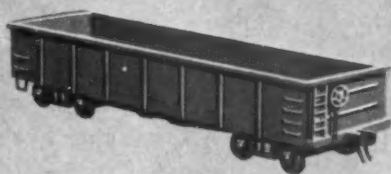
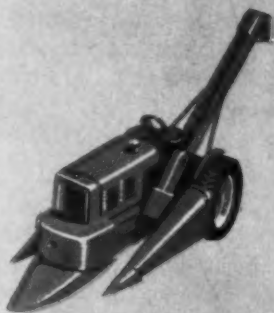
Pilot Plant . . . Frederic B. Stevens, Inc., reports that its new pilot plant for experimental zinc, cadmium, copper and nickel automatic barrel and conventional plating is now in operation. Victor G. Matosh helped to establish the new plant.

They've Moved . . . Rowland Tompkins & Son, Inc., moved its main office from New York City to a new building in Hawthorne, New York, on property adjacent to the storage shop and fabricating plant.



YOUR PRODUCTS ARE OUR BUSINESS, TOO!

Autos, appliances, transportation or farm equipment . . . if your products require flat-rolled steel, they deserve the best. And it's our obligation to see that you get the very best that 25 years' specialization in flat-rolled steel can provide.



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Sales offices in New York, Chicago,
Cleveland, Grand Rapids, Indianapolis,
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Chrysler Launches New Quality Line

Luxurious Imperial line is Chrysler's bid for a greater share of prestige market . . . Will be strong competition to Cadillac, Lincoln . . . Ford will match Chevy in style, features, power—By R. D. Raddant.



THIS CHRYSLER New Yorker DeLuxe hardtop is a typical example of the Chrysler "Forward Look" which will extend from the most inexpensive Plymouth to the most expensive Imperial. Its lower, more slender front and wraparound windshield are characteristic of all lines. Under the hood is a powerful 250 hp engine.

♦ **TWO IMPORTANT** introductions were made this week, both with significance that transcends the mere fact that more 1955 models are up for sale.

Chrysler and Imperial models, now separated for the first time into distinct lines, are the first "Forward Look" cars to show the public the means by which Chrysler hopes to regain its Big Three stature. On the new Fords, of course, hang the hope of bringing first place in sales back to Dearborn after an absence of more than two decades.

Ford Matches Chevrolet . . . Ford's sales target, Chevrolet, appeared first with all new styling, and a brand new engine, and innumerable new engineering features. Ford has matched this

record point for point and the decision will have to rest on style, personal preference or, in the last analysis, on which has the more aggressive sales force.

The emphasis at Ford is on the new Fairlane series, named after the late founder's Dearborn estate. The Crown Victoria model, distinguished by a completely new trim idea, a broad arch of chrome over the top, will take Ford well into the medium-price field.

New Power Package . . . A new high compression engine, dual exhausts and 4-barrel carburetor will provide power that should rival Chevrolet's 180 hp optional power package. Without the package, the engine will still have plenty of horsepower to advertise. While not disclosed at press time,

it should come close to or possibly surpass Chevrolet's regular V-8 162 hp. Dual exhausts, in fact, are standard on all Fairlane V-8 and station wagon models. The improved six will also be offered.

In styling, Ford has borrowed some of the Thunderbird styling effects with a wraparound windshield and a lower silhouette. An outstanding feature is a concave grille of cellular construction. Ford will also use color to increased advantage, with distinctive two-tone styling new to the industry.

Fordomatic transmission has been improved, with one particular feature designed to provide much faster pickup. By pressing the accelerator to the floor, the driver gets an automatic low-gear start. The car will normally start in second gear, but downshifts automatically to low if the extra power is called for.

Chrysler Adds Imperial . . . Because of the tremendous advance publicity, Chrysler cars have already been described pretty well in this column and elsewhere. Making a bid for the luxury trade, the Imperial, formerly a Chrysler line name, now has a place of its own as a separate line with its own distinctive features and a body not shared by any other car in the corporation. It is even built on its own assembly line.

Distinctive in both Chrysler and Imperial is the low, swept-down hood line that is easily recognizable as the work of Vergil Exner, Chrysler's chief stylist. This is getting away from the big impact

Automotive Production

(U. S. and Canada Combined)

| WEEK ENDING | CARS | TRUCKS |
|--------------------|---------|---------|
| Nov. 6, 1954..... | 103,341 | 19,748* |
| Oct. 30, 1954..... | 71,366 | 19,332 |
| Nov. 7, 1953..... | 120,377 | 13,406 |
| Oct. 31, 1953..... | 129,775 | 15,536 |

*Estimated. Source: Ward's Reports

effect that most other stylists are striving for.

Have 250 hp Engines . . . Imperials and Chrysler New Yorkers will have 250 hp V-8 engines while the Windsor will have a new 188 hp V-8 for the first time.

Chrysler's new superscenic windshield is a wrap-around but a variation from the GM-type introduced last year, which Ford resembles. It is wrapped around at both top and bottom with rearward sloping side pillars in contrast to the more conventional treatment.

Chrysler drivers will find their PowerFlite transmission's selector lever on the instrument panel, a feature unique in Chrysler cars, this year. If it is well received, the new selector position could spread throughout the entire industry. Standard transmission's shift lever remains on the steering post.

While Chrysler and Imperial styling is a good tipoff of what is to come with the remainder of the corporation's lines, it does not follow that DeSotos, Dodges and Plymouths will merely be smaller editions. In fact, the consensus of those who have seen all lines is that some of the most attractive features are found on the less expensive lines.

Correction . . . It was incorrectly stated in this column last week that Pontiac's engine production rate in 1954 was 85 eights and 30 sixes per day. That was actually the rate per hour and Pontiac operated on two shifts a large part of the year.

Incidentally, the hourly production rate for 1955 Pontiacs is much higher. On consecutive weeks Pontiac has set all time production records in its determination to lead the industry in the medium priced field.

Cadillac:

More '55 production, better price position.

The 1955 Cadillac won't be seen for some weeks, but this GM quality division has declared itself out to cover a broader segment of the market.

Based on a \$24 million program of expansion and revision of production facilities and \$18 million on tooling for the new models, a goal of 150,000 cars has been set as sales objective. This is compared to 123,600 that will be reached in the 1954 calendar year.

This is scarcely an unreasonable goal as the 1954 model run ended with a backlog of 90,000 orders, 75 pct of which were backed up by customer deposits. During the model run, Cadillac operated two shifts of 9 to 10 hr.

While few people would call the Cadillac an inexpensive car, J. M. Roche, the division general sales manager, points out that as a luxury car it has improved its price position consistently over the years by comparison to the industry pattern. According to Mr. Roche, the Cadillac price is 1.6 times the industry average, where at one time

AUTOMOTIVE NEWS

it cost 4 to 5 times the average.

Cadillac will also boast a fuel consumption rate of 18.4 miles per gal, but with an octane requirement that will be close to 95. However, that high an octane number in premium fuels has been assured for most localities.

Boost Acceleration

This year the auto industry has changed its power psychology to a more frank admission, if not of an actual horsepower race, of a performance race.

Not only are the horsepower figures thrown around impressively, but those involved will make much of their zero to 60 mph acceleration time. And some of the figures are terrific. For example, Chevrolet's power package can take Chevy from a standing start to 60 mph in 11.8 sec.

Ford's Thunderbird has them all beat at 10 sec. or under. This car probably should have a special classification despite the avoidance of "sports car" in advertising.

THE BULL OF THE WOODS

By J. R. Williams



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for these parts at
Pittsburgh-Erie Saw Corp . . .

"Latrobe's FM Steel a must"

Tool life increased 40% when machining Latrobe's "Free-Machining" BR-4 FM at Pittsburgh plant.

Pittsburgh-Erie Saw Corp., Pittsburgh, Pa., reports . . . "Because of the greater ease of machining BR-4 FM, we are reducing our production costs and especially increasing our drill life. Savings in production time combined with greatly increased tool life makes Latrobe's FM steel a must."

Pittsburgh-Erie's experience is another example of the cost-saving benefits derived from using Latrobe's "Free-Machining" FM high alloy tool steels. These FM steels—high carbon-high chromium die steels with sulphide additives evenly distributed as a result of the "Desegitized" process—consistently result in improved machinability, better machined surfaces and production economy through savings in time, labor and tool life.

Photographs Courtesy of Pittsburgh-Erie Saw Corp.

Results of Specially Conducted Test by Pittsburgh-Erie

Under the same production conditions, the performance of Latrobe's BR-4 FM die steel (with sulphide additives) was

compared to that of a regular high carbon-high chromium die steel of similar analysis and hardness.

ROUGHING CUT

| | OTHER STEEL | BR-4 FM |
|-------------------|-------------|----------|
| Speed..... | 180 RPM | 392 RPM |
| Feed..... | .014 in. | .024 in. |
| Depth of Cut..... | 1/8 in. | 1/8 in. |

FINISHING CUT

| | OTHER STEEL | BR-4 FM |
|-------------------|-------------|----------|
| Speed..... | 180 RPM | 392 RPM |
| Feed..... | .014 in. | .010 in. |
| Depth of Cut..... | .015 in. | .015 in. |

DRILLING TIME

| Hole Size 1/8" | Plate Thickness 3/4" | Hand Feed |
|--|----------------------|-----------|
| BR-4 FM—23 seconds per plate per one hole. | | |
| Other Steel—45 seconds per plate per one hole. | | |

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LATROBE, PENNSYLVANIA

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COMPANY.....

STREET.....

CITY..... STATE.....



THIS WEEK
IN
WASHINGTON

See Thin Victory for Democrats

Coalition at legislative helm . . . Democrats concede their majority falls far short of expectations . . . Southern Democrats will team with right-wing Republicans in key issues—By G. H. Baker.

♦ IT'S A coalition government that's to sit in the driver's seat in Washington during the next 2 years. Success of the Democratic party at the polls may well turn out to be a paper victory as far as calling the tune on domestic legislation is concerned.

Southern Democrats, teamed with right-wing Republicans, will call the tune on such key issues as tax revision, Taft-Hartley amendments, and progress in getting the government out of competition with business.

As a result, the eager yelps of the left wing over "victory" at the polls are to be short-lived. Democratic party leaders at the Capitol privately concede that their new majority of votes is far short of what they'd expected. And because a majority of Southern Democrats consistently vote with Republicans on important domestic issues like labor legislation, their "majority" of votes is in some areas purely mythical.

Here's what to expect on some important points:

Labor: Attempts to rewrite the Taft-Hartley Law face rough sledding, particularly in the House. Most Republicans would like to oblige Ike by voting reasonable amendments to the law, but any threat by the left wing to weaken it materially will result only in a complete stalemate.

Antitrust: Both Senate and House members talk heatedly of far-reaching monopoly investigations. Steel, automobiles, and atomic energy are being talked of as sure-fire topics for extended

public hearings. Pressure will be brought on the Justice Dept. to bear down still further on proposed mergers.

Business Loans: Sharply juiced-up lending authority for agencies like the Small Business Administration is in the works, and seems a likely candidate for enactment. Lots of congressmen liked the wide-open lending policies of the old Reconstruction Finance Corp. They'd like to see a return of federal lending on a big scale.

Forecasts Future . . . What's the U. S. economy going to be like

Plug Technical Leaks

How to keep nonsecret technical information out of the hands of Communists and other unfriendly foreign powers is being studied by a new industry-government committee.

R. Karl Honaman, on loan from Bell Telephone Laboratories, has been named by Secretary of Commerce Sinclair Weeks to head the new committee. Mr. Honaman is recruiting his committee members from the ranks of manufacturing, publishing, and government.

Secretary Weeks emphasizes that censorship is not the aim of the new committee. Rather, the committee will exercise reasonable precaution to make sure that in the necessarily free exchange of scientific information "we do not provide nations whose interests are inimical to our own with material which they could some day use against us."

in 10 years? Top congressional staff expert on business, Dr. Grover W. Ensley, says it will be a rich, full life characterized by (1) a 20 pct increase in population, (2) a 4-day workweek, (3) a 30 pct hike in disposable income.

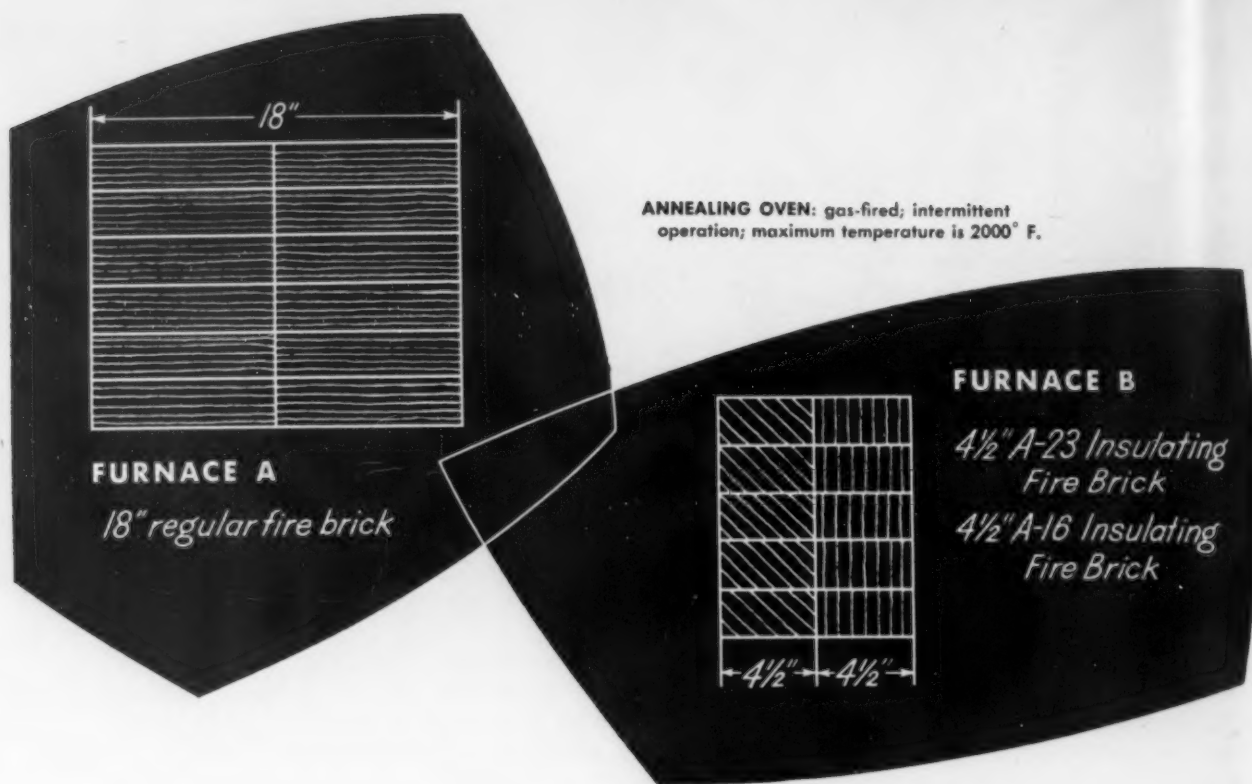
In addition, industrial productivity as measured in manhours will be advanced by 35 pct. In agriculture, the rise in per-man output will be closer to 40 pct.

Taxes, unless the nation is embroiled in a backbreaking war, probably will be lower by 15-20 pct.

Effect of the increase in population will be in sharply stepped-up demand for food, clothing, shelter, and consumer goods and services. With the advent of the 3-day weekend, for example, manufacturers should give serious thought to investing in new products that will provide leisure-time hobbies and extended family recreation.

Will Change Map . . . The anticipated 56 million households that will be thriving by 1965 will require the addition of 1.5 million new housing units annually.

There's also a tremendous market being generated by the re-planning of many older U. S. cities. Because cities and towns up to now have grown haphazardly, they are now in various stages of physical deterioration. Razing and rebuilding of whole areas soon will be in order. This is a great opportunity for private investment, and it carries with it the collateral project of relocating and rebuilding industrial plants



Which wall construction cut heat loss 56% without sacrificing strength?

High strength in refractory materials usually means low insulation value. Yet economical, efficient operation of most heat treating furnaces requires both high strength and maximum insulation. Take an annealing oven as an example. A strong lining is needed to withstand the thermal shock of cyclic operation and the mechanized shock of occasional bumping by annealing pots during charging or emptying.

To get the strength needed, in Furnace "A", 18" of heavy fire brick were used to build the furnace wall. But the result of this rugged construction was a heat loss of 722 Btu's per square foot per hour and heat storage of 51,929 Btu's. It took a lot of fuel to keep temperatures up.

In Furnace "B", on the other hand, the wall thickness was cut in half, to only 9"—4½" of Armstrong A-23 Insulating Fire Brick for the lining, and 4½" of A-16 for the back-up. This thin-wall construction re-

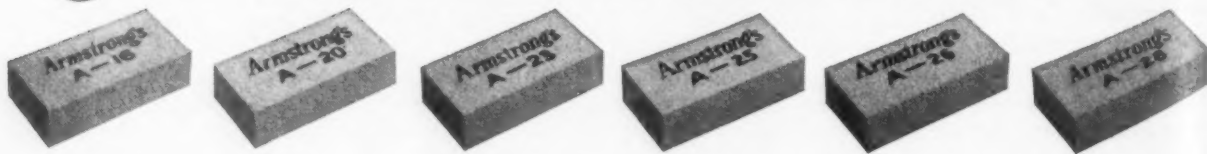
duced heat loss 56%, to 399 Btu's per square foot per hour. Heat storage dropped to 10,080 Btu's, a cut of almost 80%!

This improvement in insulating efficiency was possible because Armstrong A-23 Insulating Fire Brick are strong enough to resist spalling and withstand the mechanical abuse typical of annealing furnace service. Net results of the better constructed Furnace "B" were valuable fuel savings, faster heating cycles, and increased production.

Do you have a furnace problem?

If you're faced with the problem of building or relining a furnace, don't tackle the job alone. Call in your Armstrong engineer. He can give you advice on furnace construction and can show you the best way to get top operating efficiency from your furnace. Just call your nearest Armstrong office or write Armstrong Cork Company, 2711 Susquehanna St., Lancaster, Pa.

Armstrong INSULATING REFRACTORIES



now located in inefficient, high-cost, downtown areas of cities.

New Strike Low . . . Tighter employment conditions and reduced corporate earnings this year dropped industrial strikes to a new postwar low for the first 9 months of 1954, U. S. Labor Dept. reports.

From January through September, there were fewer strikes with less workers involved than in the corresponding period of any other year since World War II. As a result, there were fewer man-days of idleness than in other years, the Department reports.

Work stoppages in September totaled 350, the same as in August. Including workers who had gone out earlier, some 280,000 men were involved, compared with 300,000 in August. Termination of several relatively large and prolonged strikes early in September cut idleness to 2.4 million man-days, compared with 3.6 million in August.

Compare With '53 . . . For 9 months as a whole, there were 2750 new stoppages involving 1.2 million workers which caused 18 million man-days of idleness. A year earlier, there were 4286 strikes affecting 2 million workers causing 23 million man-days of idleness.

In September, there were four strikes involving 10,000 or more workers, including a brief stoppage at the Atomic Energy Commission project in Ohio; the northwest lumber strike; the Firestone Tire and Rubber Co., and Anaconda Copper Mining Co. Only the Anaconda strike continued into October.

Ask Seaway Bids

First bids to be asked for in connection with construction of the St. Lawrence Seaway will cover the new Long Sault Canal, 4 miles northeast of Massena, N. Y.

Lewis G. Castle, Administrator of the Seaway Development Corp., is seeking bids on the project, which will be started soon after the spring thaw. The canal, 10,000 ft long, will require excava-

tion of some 4 million cu yd of earth.

Mergers:

Democrats to probe sale of Follansbee Steel.

Senate Democrats urge a halt to Republic Steel's proposed acquisition of Follansbee Steel Corp. Sen. Estes Kefauver (D., Tenn.), who is slated to head the Senate anti-monopoly subcommittee come January, has ordered staff investigators to examine details of the proposed sale.

Early this week, Sen. Kefauver indicated he had not decided whether to hold hearings in connection with the probe. One possible outcome of the study could be an official request to the Justice Dept. to block the sale.

Unions Protest Move

Sen. Harley M. Kilgore (D., W. Va.), a member of the subcommittee, predicts the study will delay plans of Republic to shift equipment from Follansbee to its Gadsden, Ala., plant. The moving plans are bringing heated protests from labor unions in West Virginia.

Intermediary in the merger is Frederick W. Richmond, New York financier. Republic is the third-ranked steel company with invested capital over \$606 million. Follansbee with 28 annealing furnaces and two tinning pots for long terne sheets, listed total revenues of \$28.5 million in 1952.



"Let's ask Fred. He has a pipeline direct to the front office."

WASHINGTON NEWS

Government antitrust officials recently threatened to start legal action against a proposed merger of Youngstown Sheet & Tube and Bethlehem Steel, but the firms hint the merger will be attempted anyway.

Building:

Set new October dollar volume record.

Builders continue to breeze past former construction records, giving every indication that they will complete the year with a total of \$37 billion worth of new work put in place.

Latest record was in October, when new work had a dollar value of \$3.5 billion. Preliminary counts show the volume to be 3 pct less than that for September, as was expected, but 8 pct greater than that for October 1953.

Categories in which activity reached a new alltime October high include total private and total public construction, private residential building, churches, public and private schools, roads, and sewer and water facilities.

Heavy gains for the first 10 months of this year were registered in the value of new private construction. This value is figured at \$21.1 billion, or 6 pct more than in the comparable period of 1953.

At the same time, though, public outlays were in about the same range as those in 1953, at \$9.7 billion. State and local government spending has been filling the gap created by a drop in federal expenditures.

Women Engineers

Job prospects for women engineers are excellent because of an estimated excess of demand over supply of 30,000 engineers a year in industry, Dept. of Labor points out.

There is a relatively wide choice of jobs open to women engineers, the Department says, and employers in almost every kind of industry hire them.



IMPACT!



Why is Malleabrasive packed with power? Because it keeps its *punch* longer . . . retains its original grain size longer! After ordinary abrasives have shattered into "fines" and passed into the dust collector, Malleabrasive *still* stays young—alive with power!

Malleabrasive has all the toughness of malleable iron PLUS peculiar hardness characteristics provided only by our patented Malleabrasive process. This amazing combination results in fast cleaning combined with tremendous reduction in wear on machine parts.

That's why foundrymen agree that Malleabrasive is the iron fist for cleaning, but the velvet glove for machine parts wear. No "fines" here to chew machine parts to bits! Malleabrasive *wears* down . . . never shatters . . . continues punching to the end!

Get the full story about Malleabrasive. Write THE GLOBE STEEL ABRASIVE CO., Mansfield, Ohio.

"If you use metal abrasive, you should use Malleabrasive."

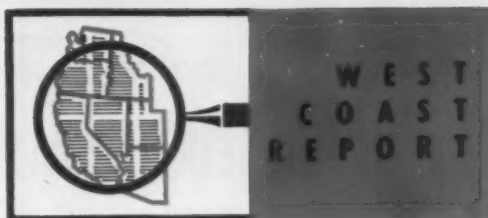
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World's largest manufacturers of Malleablized Shot and Grit

Established 1907

U. S. Patent
2184926 (others pending)



Steel Industry Ponders Problems

Effective smog control, industrial relations, earthquake prevention discussed by steelmakers at AISI meeting . . . California raw steel capacity now 3 million tons annually, up 272 pct in 15 years—By R. R. Kay.

♦ **PROBLEMS** running the gamut from smog to human relations had the spotlight at American Iron and Steel Institute's San Francisco meeting.

And the western steel-making fraternity, gathered at the Fifth Regional Technical Meeting, got a glowing picture of their industry's growth.

Curb Openhearth Smoke . . . An attempt to clear the air on the smog problem with a precipitator unit on an openhearth stack proved successful for Kaiser Steel Corp. After two years of experimenting and revising, the precipitator now functions at about 95 pct efficiency. Kaiser will put units on three more of its nine stacks at the Fontana, Calif., plant, according to J. H. Smith, Kaiser's technical engineer on air control and research.

A practical approach to air pollution control is offered by Mr. Smith in a five-step plan: face the problem; do what you can immediately to alleviate it; begin basic research on the unsolved portions of the problem; incorporate your findings into specialized equipment; and above all, let the public know all along what you're doing about it.

Safety Promotes Efficiency . . . Maximum output from every worker in the steel industry is more than ever essential in today's highly competitive markets. Top production comes only through a worker's willingness, loyalty, enthusiasm, and pride—all products of good human relations.

Rudolph Smith, Colorado Fuel & Iron Corp.'s Minnequa plant works manager, said CF&I found that better human relations can be had through a sound, sincere, and honest safety program. Because industrial safety has tangible results, it's a splendid stepping stone to improved human relations.

Prevent Quake Damage . . . "The earthquake problem is well understood today. . . . Great losses have been traced to the use of weak and brittle materials, those with little or no ductility or toughness. Steel has supplied the answer in each case. Today, unreinforced materials are seldom used in seismic areas, stated R. W. Binder, chief engineer, Fabricated Structural Steel Div. of Bethlehem Pacific Coast Steel Corp., San Francisco.

Mr. Binder reported that buildings respond to an earthquake ground motion according to their size, shape, mass, rigidity, damp-

ing characteristics, and the soil in which they're located.

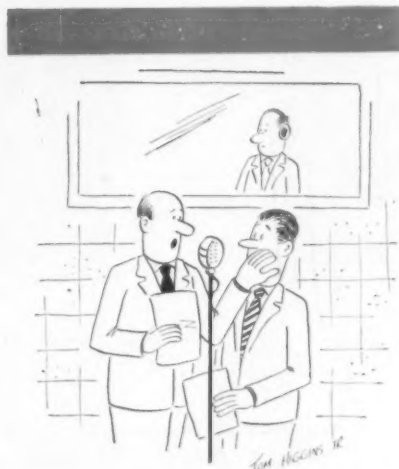
Cite Steel Capacity . . . California got lavish treatment from Max D. Howell, AISI's executive vice-president. He pointed out it is now the ninth largest steel-producing state; its raw steel capacity exceeds three million tons per year, 272 pct higher than 15 years ago.

"Even more impressive is the expansion of finished steel product capacities in California. The state's capacity for total hot-rolled steel products is now nearly four times greater than it was 15 years ago," Mr. Howell said.

Add Plant Facilities . . . Kaiser Steel Corp.'s 36-in. blooming mill at its Fontana, Calif., works, is blossoming into a 46-in. mill. Work began this week. Kaiser Engineers, handling the job, say they expect to finish in only eight days what is usually a 3-4 week operation. Inventory build-up will tide the company over the down period.

Encouraging words were heard by Pacific Northwest shipbuilders. Asst. Secretary of the Navy Raymond H. Fogler promised in Seattle he would recommend hustling along the \$22 million drydock scheduled for Bremerton (Wash.) Navy Yard. He will try to have the work start late in 1955. Present plans call for its inclusion in the Navy's 1957 budget.

Rheem Manufacturing Co.'s San Pablo (Calif.) Ordnance Plant received \$1.5 million in Army Ordnance contracts for ammunition. Production is expected to run throughout next year.



"We interrupt this program to bring you an important announcement!"

Don't wait—your competition isn't!
You can replace obsolete
equipment now on our

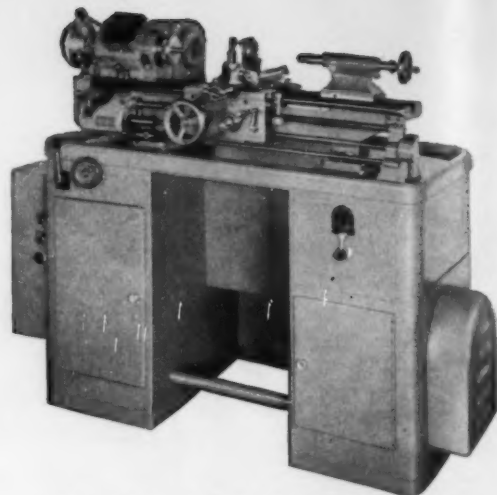
DEFERRED PAYMENT PLAN

and enjoy extra profits while
you purchase. Your actual savings
will probably cover the cost
of these efficient machines in
two years, or less!

Write today for special circular "DPP"

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precision machines

To keep pace with your competition, you need
the latest, most efficient production machines you
can buy. Here are four that are remarkably accurate
— designed and built throughout for precision work
to close tolerances. Some of the features on each
machine are patented and exclusive. All machines
are carefully described in Bulletins,
available on request.



No. 8A Tool Maker's Precision Lathe

A variable speed feed for the feed rod is available as optional equipment. It provides an independent powered longitudinal or cross feed which permits the operator to change the rate of feed while the tool is under cut to secure the desired work finish during turning, facing or boring operations. The rate of feed for variable speed feed is controlled by a potentiometer.



Hand Profiling Machine



No. 73 Hand Screw Machine



No. 73 Standard Bench Lathe

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THE WADE TOOL CO.

WALTHAM 54, MASS., U. S. A.

MAKERS OF
PRECISION TOOLS FOR
AMERICAN INDUSTRY



Pentagon Ready New Tool Orders

Procurement officers prepare orders for long-lead-time tools under \$100 million authority . . . Doubt contracts before December-January . . . Defense ponders further funds request—By E. J. Egan, Jr.

♦ **MILITARY** procurement officers are about to begin the complicated task of working out actual orders for the first long-lead-time machine tools that will be bought with the \$100 million special authority granted this year by Congress.

This is the next big step that must be taken, following President Eisenhower's approval last week of the Defense Dept. program for buying production equipment.

Will Take Time . . . Money to pay the bills is now being channeled to the procurement level. Before contracts are actually placed, however, a very considerable amount of engineering planning and related activity will be necessary, for most of the tools wanted are large and complex.

Likelihood now is that first tool orders will not go out for a number of weeks—perhaps not until late December or early January.

Air Force will get the heavy share of tools with this \$100 million remnant of the original Vance Plan. Major items will be stretch forming and skin milling equipment. Such machines can be used to make current or proposed aircraft designs, thus meet an important military planning requirement for efficiency and economy.

Ask for More? . . . Army and Navy tool purchases will fall into the same general purpose category, except for a couple of complete production tooling setups. These exceptions will guarantee immediate manufacture of certain critical items if the need arises.

The \$100 million Defense will spend is only one-fourth of what the preparedness planners would like to have in new machine tools. For fiscal 1954, Congress gave the Pentagon \$250 million to start the Vance Plan, but spending plans weren't solidified and the money wasn't used. For 1955, an economy-minded Congress cut the fund to \$100 million even though defense officials had lined up \$407 million in tooling needs.

With a new Congress coming in, defense planners will have to decide soon whether they want to try for the \$307 million they still need. Feeling is that any request for new appropriations will get a better response if the current spending program is smoothly underway when budget talks begin.

Still Counting . . . With plans for new tools moving along, Defense Dept. gives no indication that it intends to begin leasing or selling any large quantity of

the tools it owns. Chances of such an action are remote at this time.

Still in doubt, of course, is a really accurate figure on the number of usable tools which the military services own. Progress is being made on the tool inventory, but only an estimated two-thirds of these items have been catalogued.

Each must be coded, and coding is a time-consuming job. Though a count will be completed earlier, it may be as much as two years before a fully accurate, detailed inventory is ready.

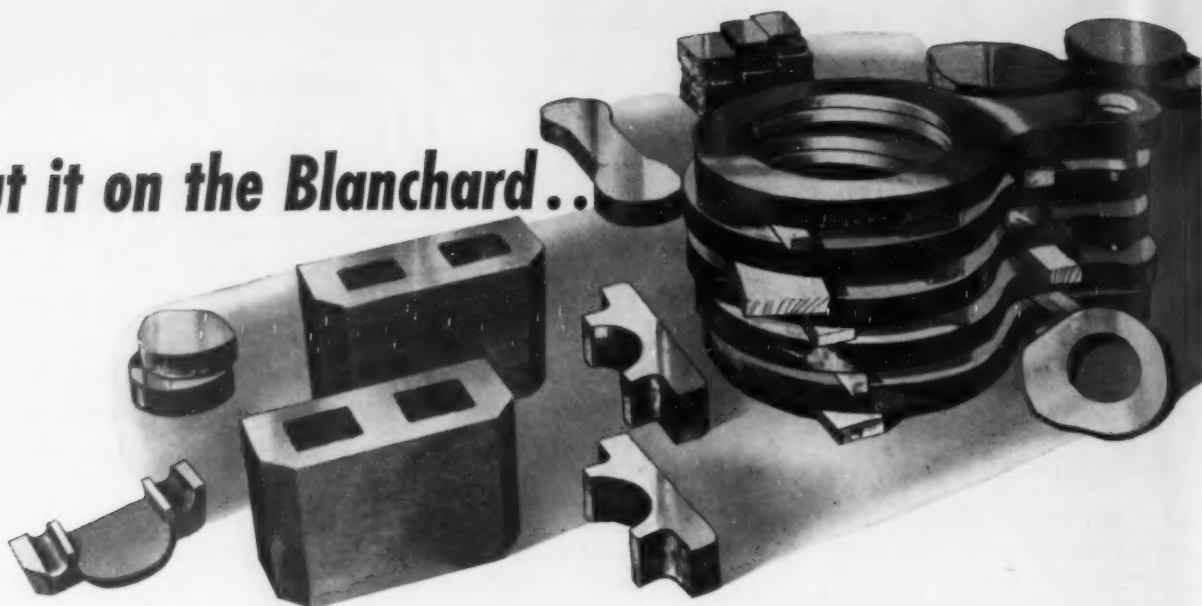
Study Elephant Needs . . . Office of Defense Mobilization's announced plan to begin stockpiling elephant machine tools soon isn't nearly so far along as the military machine tool program. Even Dr. Flemming's \$40-million estimate might turn out to be wide of the mark. Business & Defense Services Administration has been asked to help ODM by recommending a procurement program. But BDSA hasn't decided yet.

BDSA officials are meeting with metalworking industry representatives this week in Washington to discuss elephant tool needs in case of an emergency. Presumably it will take some time before ODM can set up a final schedule for quantities and types.

New Entries . . . The Detroit Broach Co., a leading manufacturer of broaches, broaching tools and fixtures, has quietly entered the broaching machine field. From its new plant in Rochester, Mich., the company has shipped 40 machines since the first designs were laid down in April 1953.



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The Iron Age

SALUTES

Don McPherson Head of a top metallurgical research laboratory at 32, he sparked development of titanium alloy plate—potential successor to steel armor plate —has made many important contributions to light-metal technology.

With the announcement earlier this year that a titanium alloy plate had been developed that could replace steel in military weapons, an entirely new approach to defensive warfare became possible.

To youthful Dr. Don McPherson, heading the 30-man physical metallurgy department in the Armour Research Foundation, must go the lion's share of the credit. At 32, Don McPherson looks more like a college senior than a national authority on titanium alloys, who received his bachelor's degree in metallurgical engineering at Ohio State in 1943—his doctorate from the same institution in 1949. In 4 years he has risen to the top post in the largest of Armour's 9-section Metals Department.

His excellence in the field of metals research has been acknowledged by fellow metallurgists, who have chosen him a member of the titanium committee of American Institute of Mining and Metallurgical Engineers' Institute of Metals Division; a member of the panel on titanium sponge quality for the Metals and Minerals Ad-

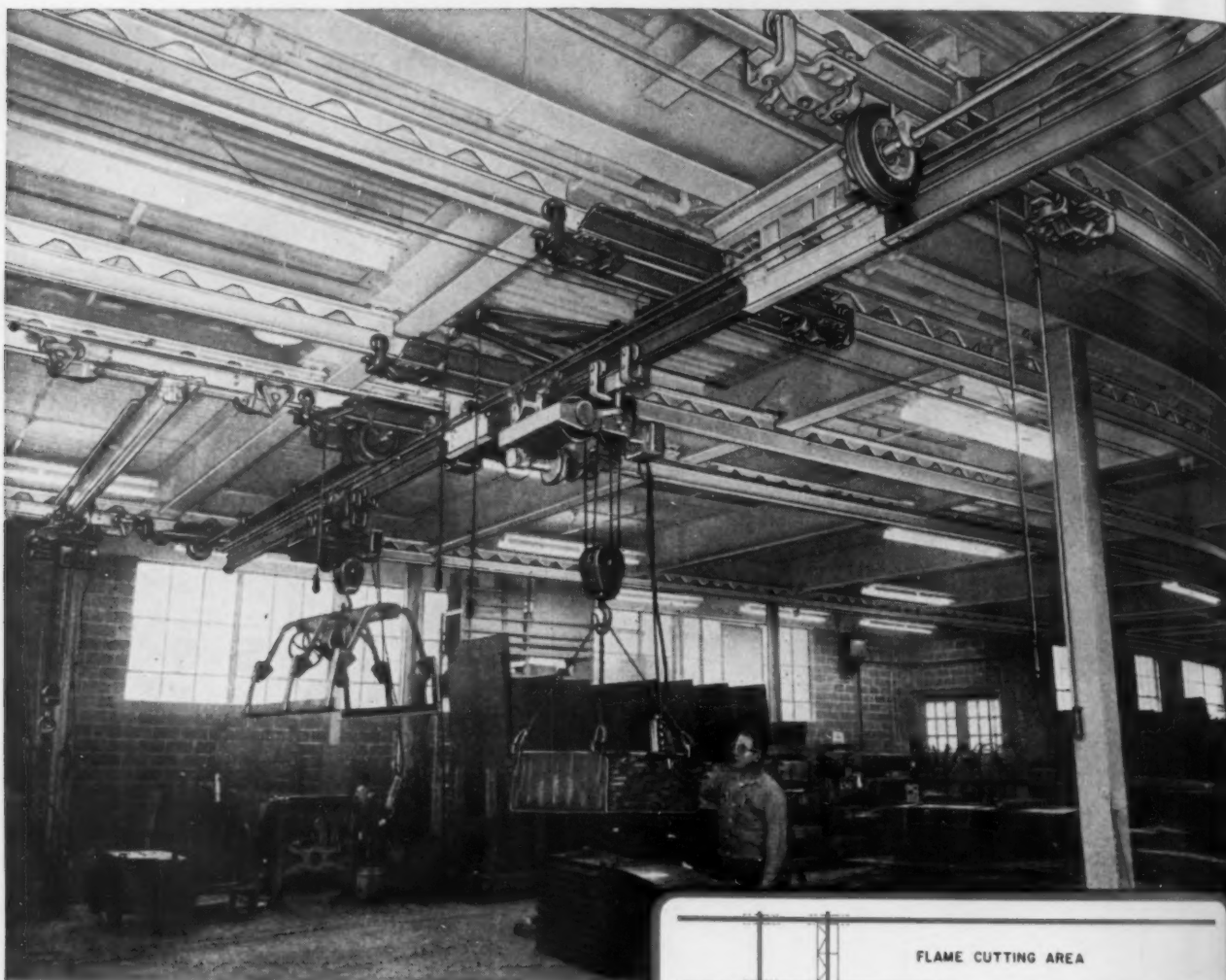
visory Board of the National Research Council; and he is serving on the metallurgical advisory committee on titanium for Watertown Arsenal, from which came first announcement of the titanium alloy plate which has the strength of steel plate at 40 pct of the weight.

Called by his section members an able leader with a keen sense of humor, Don McPherson has managed to take time from his manifold research activities to become expert in both his hobbies, the collecting of jazz records and photography. Armour associates report that he's become an expert on Dixieland jazz.

No ivory tower dweller, Don McPherson is keenly aware of the needs of the titanium industry, and the impact that research will have on it, particularly in the aircraft industry.

A resident of Oaklawn, a Chicago suburb, and the father of two girls, Don McPherson has already made important contributions to the science of metals, seems destined for many more.

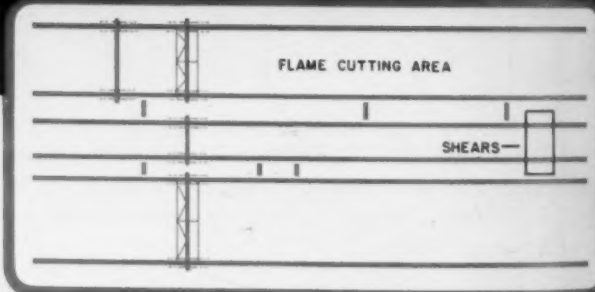
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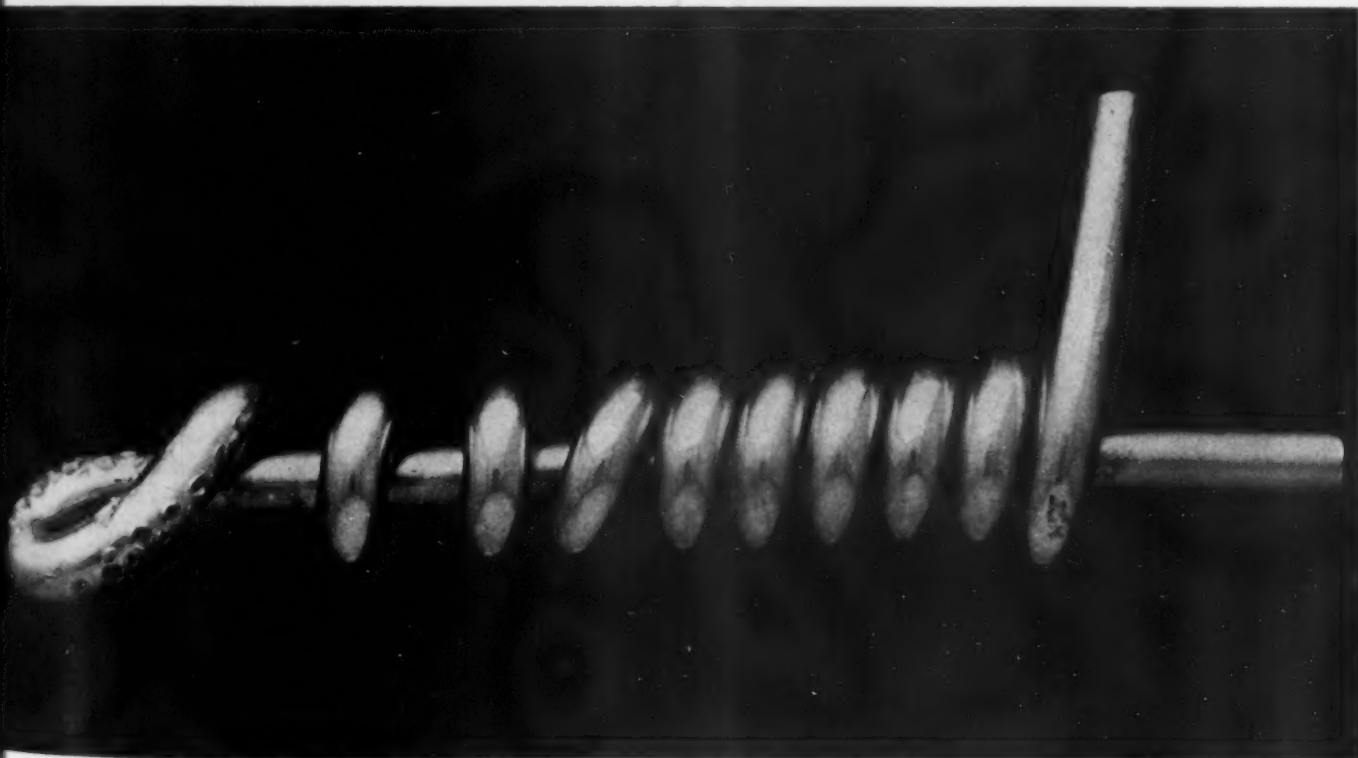
Compact Unit Plates Heavy Ductile Coatings on Steel Wire

By Herbert Kenmore, President
Kenmore Metals Corp., Jersey City.

♦ Heavy ductile coatings of copper, nickel and other metals are now applied economically to steel wire with a plating unit which only occupies a 30 by 6-ft floor space . . . Compact design is made possible by spiralling the wire through the plating baths.

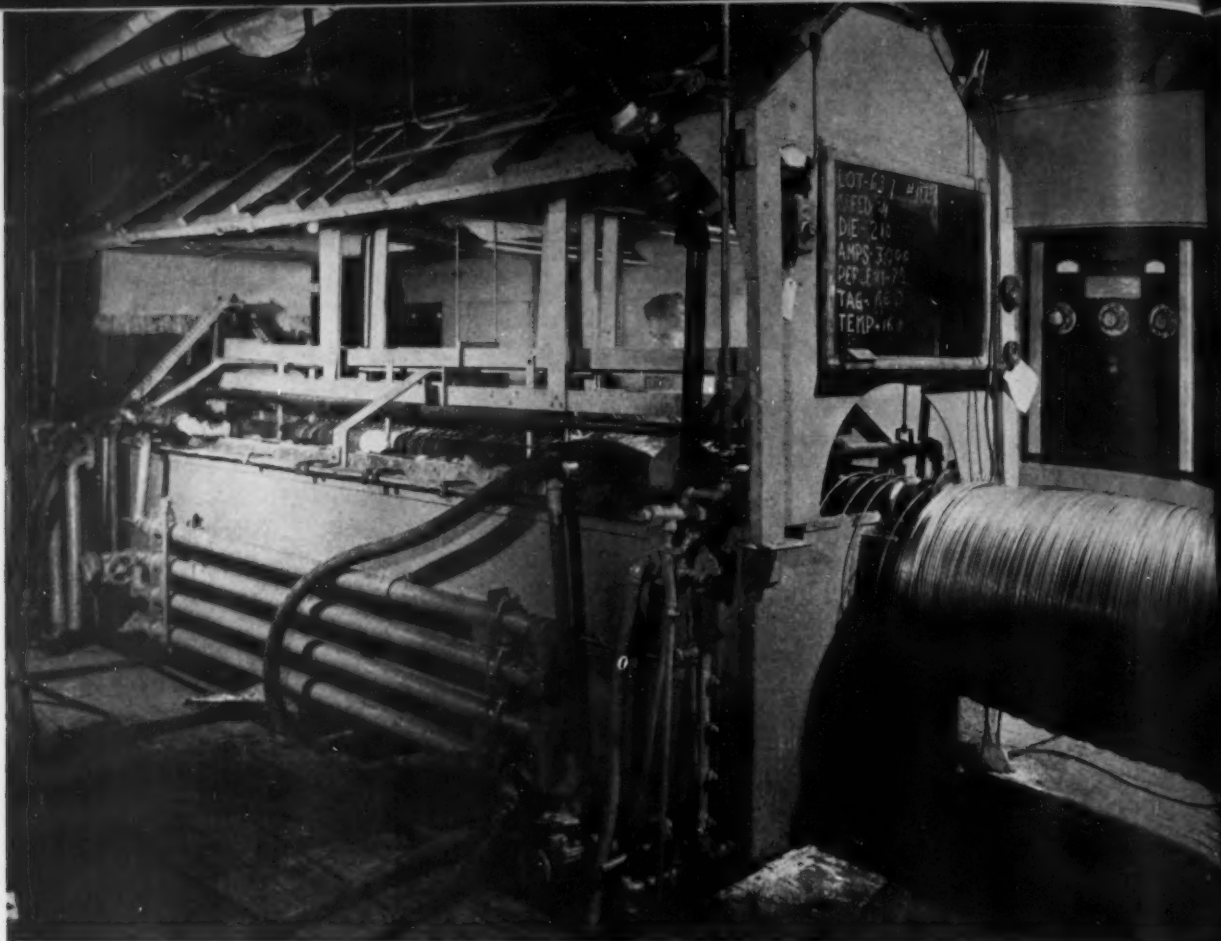
♦ About 900 ft of wire are processed at one time . . . Coating thickness is recorded continuously . . . After plating, wire is subjected to drawing and heat treating without flaking of the coating.

♦ PROTECTIVE COATINGS on steel wire and rod are now being applied by a plating process which conserves expensive coating materials, greatly reduces floor space requirements and produces ductile coatings for subsequent drawing without flaking. Recently developed by Kenmore Metals Corp., Jersey City, the patented



COPPER-PLATED steel wire can be wrapped around itself many times without cracking, peel-

ing or flaking of the adherent coating. Marks at left side are from vise pressure.



COMPACTNESS of plating equipment saves much floor space. About 900 ft of wire are

plated at one time in a total area of 30 by 6 ft. Wire enters and leaves tanks 432 times.

process plates wire or rod up to 900 ft long in a continuous single-strand system in an area only 30 by 6 ft.

Compact equipment design is made possible by feeding the wire through the plating cycle from a spiralled coil. Hot-rolled wire of any size from 0.217 to $\frac{1}{2}$ in. diam is first passed through a wire die of slightly smaller diameter. As it emerges, it is pushed through a straightening device and coiling mechanism which spirals the wire. The spiral passes over a rotating horizontal roller which imparts forward movement to the continuously forming spiral.

Equipment compactly designed

The horizontal roller is located over a series of cleaning and plating tanks. As the wire advances progressively, it continuously enters and leaves the cleaning and plating tanks in proper sequence. Since the wire pitches forward at less than a 1-in. spacing, it enters and leaves the various solutions 432 times in its trip through the series of tanks. Because of this compact equipment design, about 900 ft of wire are constantly being plated.

Originally, zinc and tin were the metals most commonly coated on steel wire for corrosion resistance. Copper was applied to improve electrical conductivity. Now, the process is also applicable to nickel and other metals. Zinc-

coated steel wire is usually used for fence and wire rope fabrication to combat normal corrosion. Copper and nickel-coated wire are used mostly in heavy industrial areas where sulphide, acid and salt-laden atmospheres may be more of a corrosion problem.

An important aspect of plating is the manner in which metal deposit thickness is controlled. Specially designed instruments keep a continuous record of travel speed of the wire and the amount of current used. Each coil of wire to be plated is numbered, and the time of introduction is noted. This information is also registered on the recording tapes of the instruments. After plating, the tapes represent a permanent record of coating thickness throughout the coil.

Recording of the plating thickness serves several purposes. The recording tape assures the customer that the plating thickness, inch by inch, is as specified. Second, it establishes the basis for pricing. Third, it serves as a check against human errors.

Current carrying ability studied

In the case of copper-plated steel wire, a study was made to determine the contribution of steel as a current carrier. The more current that can be carried by the steel core, the less copper would be required for the coating. The study shows that when more copper is deposited, the steel

core makes less of a contribution. Also, the current-carrying capacity of the steel wire varies with analysis, particularly as it applies to carbon content.

A C-1010 steel has 10.3 pct the current-carrying capacity of copper; C-1040 has 9.8 pct; and C-1060 has 8.4 pct. If 10 pct copper by weight is deposited, the conductivity increases only 8 pct. By depositing 26 pct copper by weight, the contribution of steel is only 4 pct, and if 40 pct copper is added, the steel makes practically no contribution.

Cleaning, plating carefully controlled

Another important aspect of this process is that coatings are not applied to finished wire sizes. After plating, the wire is drawn and heat treated to produce the required specifications. Because of this further processing, each phase of the cleaning and plating cycle must be carefully controlled to obtain the fine-grained, pore-free, ductile coatings necessary for drawing without flaking.

Previously, heavy coatings of copper on steel wire were applied by a process in which copper was melted around a heavy steel billet, then drawn. This process required considerably more copper for adequate corrosion protection since close control of the initial product was difficult. Using the new process for any army project which called for an 0.006-in. thick coating of copper on steel, the saving in copper alone amounted to about one million pounds annually.

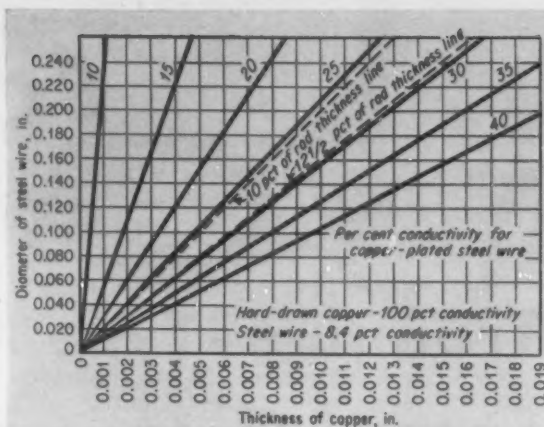
Corrosion-resistant steel wire is used for high-voltage power transmission lines, guy wires, telephone lines and switchboards. It is also used to replace stainless steel in automobile radio antennas, spring wires, industrial belting, industrial baskets and many other services.

Coating reduces drawing problems

A copper coating on stainless steel wire reduces the problems in drawing. Chrome oxides, which impair the properties of the wire, are difficult to remove. A light coating of copper on the stainless wire prevents the formation of chrome oxides and provides a good lubricant for drawing. This results in high-speed drawing, an improved product and less die wear. After drawing, the copper is removed to leave a clean, stainless finish.

Coating of copper on aluminum can help to extend the use of aluminum for electrical conductors. Aluminum oxidizes readily in air, setting up high resistance at connections. A thin coating of copper on the aluminum overcomes this objection economically.

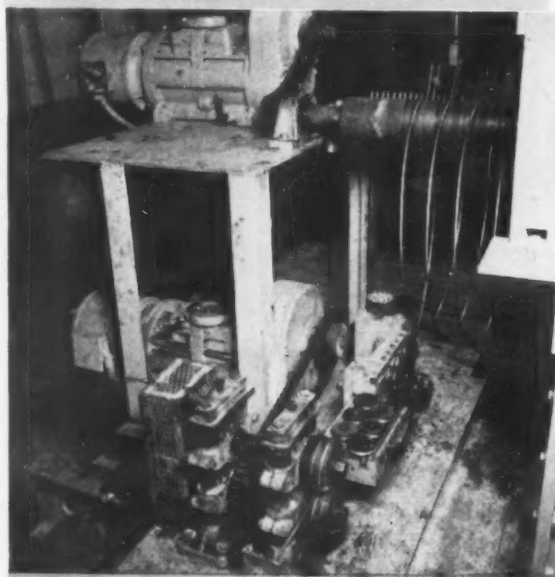
Adherence of a copper coating to a steel core is very strong. A steel wire having a 0.20-in. diam and a 0.006-in. coating of copper can be wrapped around itself eight times without the coating cracking, peeling or flaking, or showing any porosity.



APPLICATION of proper thickness of copper on steel saves metal and plating costs. Graph shows relationship for required conductivity.



FRACTURE of copper-plated steel wire shows adhesion of coating. Wire is subsequently processed by drawing and heat treating.



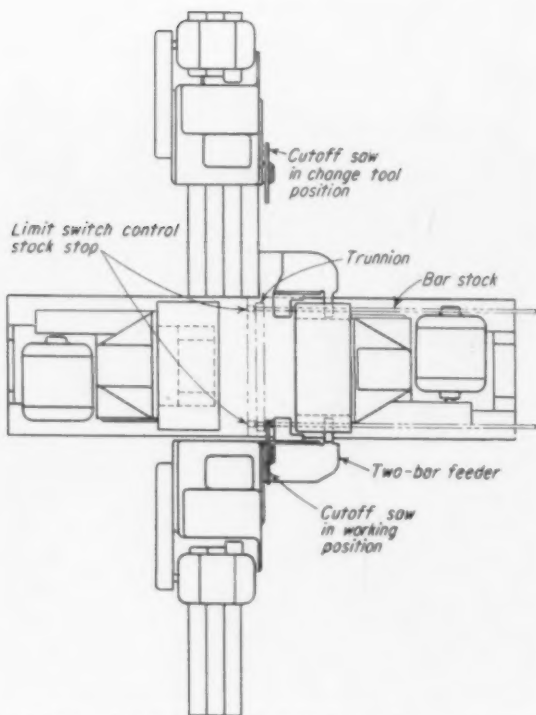
DRIVE MECHANISM feeds wire into plating bath in a spiral. Roller extending over plating tanks gives wire its forward movement.

Does four jobs—

Trunnion-Type Machine Speeds Output of Precision Parts

♦ A two-way horizontal trunnion-type machine equipped with an automatic bar stock feeding mechanism, saws, drills, reams and faces more than 625 piston pins per hour . . . Its design permits 34 drills to operate simultaneously . . . Trunnion wheel indexes automatically . . . Savings are substantial.

By W. G. Patton, Asst. Technical Editor



TRUNNION-TYPE MACHINE forms a large cross on the floor plan. When in operation, two pieces of bar stock are fed from magazine rack.

♦ HIGH PRODUCTION in a given floor space and automatic delivery of a large volume of precision parts for induction heat treating and final grinding of the outside diameter is accomplished in a new Baker piston pin machine at the Ford's Dearborn engine plant. In addition to automatic sawing and step drilling, facing and reaming operations are performed by the same machine.

The machine is built in the form of a large cross. At one end, on each side of one arm of the cross, is a magazine rack loaded with bar stock. Two bars are fed at a time from each side toward the center of the machine where they are gripped and held until the rough ends have been cut off automatically.

On subsequent cycles, the two pairs of bars are fed forward through two chucks in the trunnion wheel and clamped. The next operation consists of sawing the bars while they are still being held in the trunnion wheel. After clamping, the bars are held in the trunnion wheel until all operations have been completed.

After the bars have been sawed to length, the trunnion wheel indexes automatically. This presents the parts to a two-way drilling head which drills to one-seventh the depth. The timing of this operation permits optimum output.

The machine has this unusual feature: two bars inserted on one side of the machine proceed on the lower half. Meanwhile, the two bars inserted on the opposite side proceed over the upper half. Actually, 34 drills operate simultaneously.

Heads hydraulically powered

Following the drilling operations, facing and chamfering operations are performed. Use of a high-speed reamer permits a penetration rate which is seven times the drilling rate. To achieve this high rate of acceleration, special slides within the heads are hydraulically powered.

Special chip removal equipment carries away chips through the base of the machine. Working at capacity, the machine generates more than 300 lb of chips per hour.

Although classified as a special machine tool, flexibility has been designed into the new machine. It can be set to run one type of pin on the top half of the machine and another length of pin and hole diameter on the lower half of the trunnion. It is necessary to use the same size stock on both the upper and lower half of the trunnion.

A large volume of coolant is directed at the center of the machine to keep chips moving toward the conveyor.

The machine has two 30 by 24 in. bar way

saddle units. These are mounted horizontally and opposed for the drilling, reaming and facing operations.

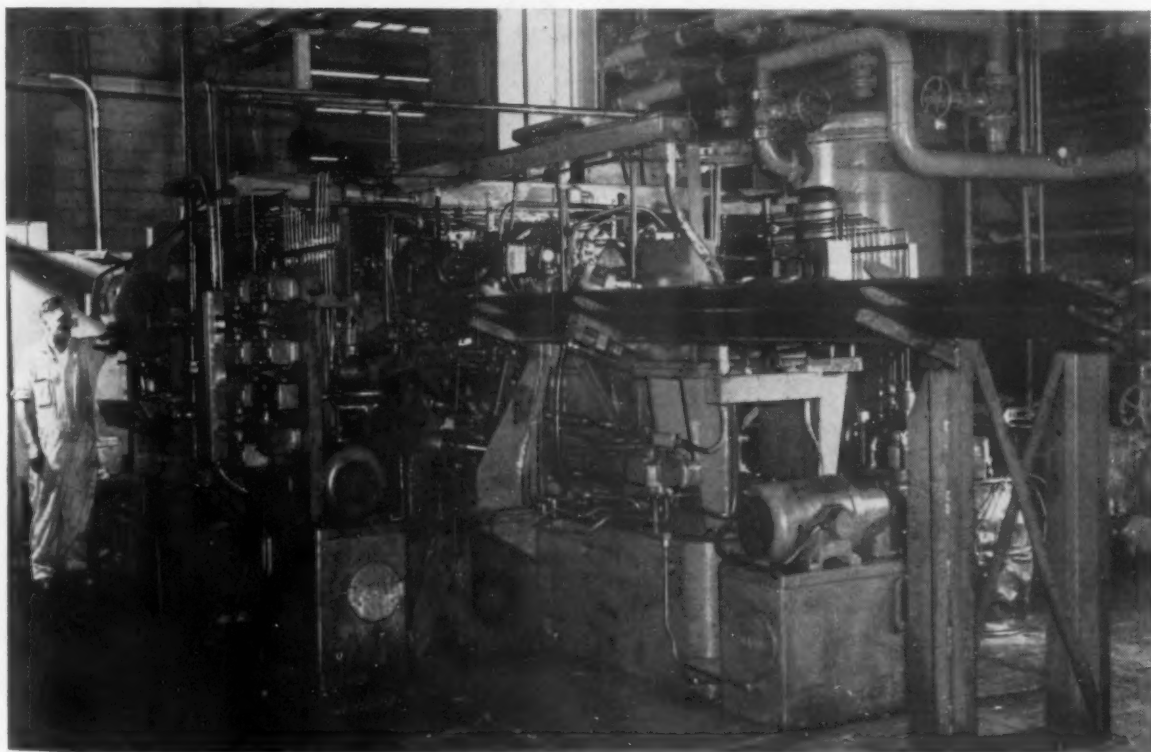
The left end unit has a 28-spindle fixed center heavy-duty ball bearing head with four accelerated spindles actuated by separate hydraulic cylinders. The right end unit has a 20-spindle fixed-center bearing head.

Two automatic magazine-type bar stock loading mechanisms pressure feed two bar rolls into position for the Motch & Merryweather saw heads which are mounted at the front and back of the machine. Each saw handles two bars.

The fixture is an automatic power-indexing, 18-station two-way horizontal trunnion-type workholding fixture. Two parts are held at each station. Parts are fed automatically at the sawing station and clamped by V blocks.

Permits substantial savings

Engineering studies showed that this type machine would save substantially over conventional methods of making piston pins. These savings apply whether the pins are made from tubing or by the use of automatics of the conventional type. At the time these machines were designed, removing the metal in the form of chips by drilling was the most economical way to put a precision hole in a piece of steel of this size while leaving a relatively heavy wall.



TWO BARS from each side of magazine rack feed into trunnion-type machine which saws,

drills, reams and faces more than 625 pins per hour. Chip removal equipment is included.

Use more of the stock—

Improve Blanking Layouts To Cut Material Costs

♦ Material costs can often be reduced with die layouts designed to utilize a greater degree of stock . . . Most parts resemble one of the standard geometrical figures and can be arranged to keep scrap losses at a minimum . . . Where tolerances permit, totally "scrapless" die designs may be used.

By Federico Strasser, Consultant, Santiago, Chile

♦ **ECONOMY** in strip layout, systematically applied to obtain the greatest number of blanks from a given weight or surface of stock, can yield appreciable materials savings in blanking operations.

Of several possible layouts, that which offers a higher stock utilization factor is usually preferred. This factor is the ratio of blank area to the greater metal area needed to produce that blank.

An L-shaped blank with a blank area of 0.79 sq in. may be used to illustrate several possible solutions to a blanking layout. One layout requires 1.58 sq in. of stock surface for each blank. The utilization factor of 50 pct is unacceptably low. Another layout uses the same strip width and a somewhat greater center dis-

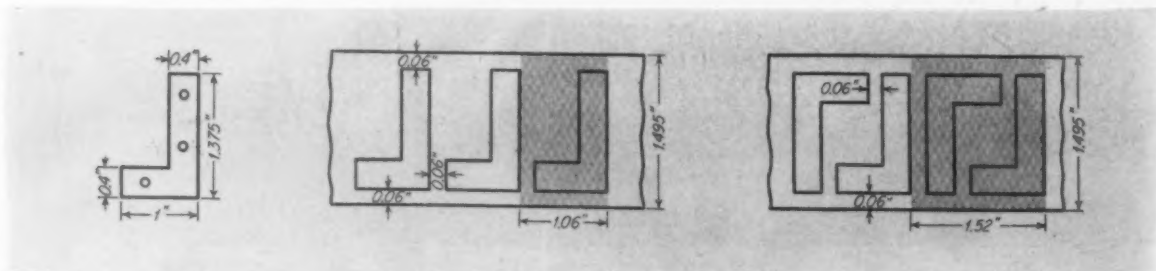
tance for two components located in inverted position. Stock needed for each stamping is 1.136 sq in. The utilization factor is almost 70 pct. By using a wider strip and an inverted arrangement placing the long side of the L parallel to the strip edge, the metal needed for a component may be reduced to 1.035 sq in. The utilization factor is 76.4 pct.

Inverted location of the blanks in a strip is not always practical. The inclined layout of parallel L blanks requires only 1.075 sq in. of stock for each stamping. The utilization factor is 73.5 pct.

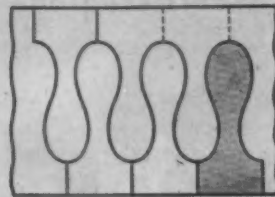
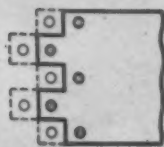
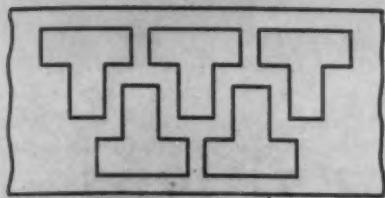
A "scrapless" design reduces waste to a negligible amount. Metal needed is 0.866 sq in. per blank, corresponding to a utilization factor of 91.3 pct, for a layout with no bridge.

Utilization factor alone, however, may not be the deciding factor in a layout arrangement. Other conditions must be considered, some of which may be incompatible with most economical

MR. STRASSER, well-known consultant and author, is presently in charge of tool design for a Chilean manufacturer of electrical and plastic components.



SEVERAL layouts are usually open to the die designer as illustrated by this L-shaped part.



REVERSE BLANKING and "scrapless" die designs permit a higher degree of material utilization.

strip blanking layout. These conditions include:

1. Close dimensional tolerance required. The scrapless design is not a precision job.

2. Grain direction. In stampings destined for further bending or forming, the grain must lay preferably across the bending line; in no case at less than 30° angle.

3. Standardized coil or strip sizes. It is good practice to limit the number of strip-widths handled and, for new dies, choose one of the standard width sizes.

4. The proposed width may give an uneconomical strip division of commercial shee

In case of multiple and/or inverted blank layout:

1. Center distances may be too great for high-speed production.

2. Final waste of short strips may be large.

3. Strips may be too cumbersome to handle.

4. Because of the extra handling involved the increase in labor cost must be more than compensated by the possible savings in material.

Most layouts fall in pattern

Most strip layouts can be classified in one of a few basic patterns and handled accordingly.

The simplest contour is the circular shape. This, however, among the geometrically regular figures, is the worst from the standpoint of economical layout. Stock utilization may be improved by blanking two rows of workpieces in staggered form. A comparatively small increase in strip width, beyond that needed to blank a single row of circular pieces, yields an additional row of blanks, considerably increasing the utilization factor.

Rectangular components are the best from the layout economy standpoint. The utilization factor frequently reading 85 to 90 pct. Blanks

should be located with their longer sides across the strip-axis to keep waste at a minimum. Parallelograms should be treated as rectangular blanks. The shorter side should be located parallel to the strip-edge.

With trapezoid blanks, highest stock utilization is obtained by alternating the blanks in the strip. Vertical sides are always parallel to each other.

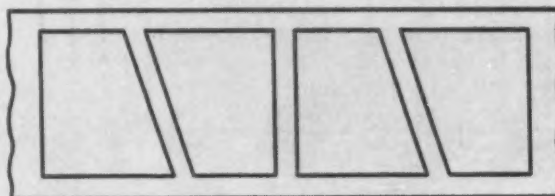
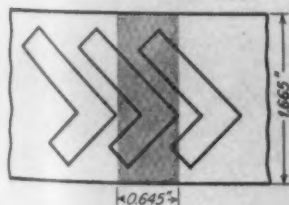
The T-shaped blank should be alternately reversed for best stock utilization. U-shaped blanks should also be reversed.

This table refers to hard metals—steel, brass, bronze—straight line contoured blanks and for only one pass of the strip. For softer metals such as copper, zinc and aluminum increase values by 20 to 25 pct. For circular or elliptical shapes, values may be decreased by 25 to 30 pct.

In reverse blanking the strip-skeleton must be stronger to resist more handling and scrap-allowances should be increased by 20 to 25 pct. For very thin stock, comparatively high values are given to counteract the tendency of the strip to buckle and distort.

In special cases the lateral or intermediate or both bridges can be eliminated. In all these cases, however, the possibilities of stock-savings depend on the shape and form of the workpieces and exist only when tolerance limits are rather ample.

Square and rectangular components are easily produced without waste. In stamping square nuts, usually the only waste is the hole slugs. Hexagonal nuts are also stamped in this manner, eliminating the bridge between adjacent blank-openings. Any workpiece in which both end contour lines are matching male and female shapes, usually permits elimination of an intermediate bridge.



BEST LAYOUT is usually that which gives the highest utilization of strip material.

How Austenitizing Conditions Affect Medium Alloy Steels

♦ Austenitizing conditions are important factors affecting the transformation characteristics of steels . . . In this investigation of three medium alloy steels—4695, 9395 and 8695—the effects of temperature and time in heat treating were closely studied.

♦ Within the range of commercial austenitizing practice the M_s temperature could be raised more than 100°F . . . This could mean a reduction in the residual stress state as well as the amount of austenite retained from the austenitizing treatment . . . Time, after 1 hour, has only a minor influence on carbide solubility.

By A. R. Troiano, Head

R. F. Hehemann, Assistant Professor

Dept. of Metallurgical Engineering, Case Institute of Technology, Cleveland

Part I

♦ LOW-CARBON, ALLOY STEELS are widely employed in the carburized condition. As such, post carburizing heat treatments are dictated largely by the requirements of the high carbon case. A variety of treatments are employed commercially, and one critical aspect of these is the austenitizing temperature and time prior to quenching.

Variations in the austenitizing conditions will influence the degree of solution and the distribution of the carbides as well as the austenite

grain size. These, in turn, control the M_s temperature, the retention of austenite, and in fact, all the transformation characteristics with their attendant effects on hardenability and residual stress state.

The influence of austenitizing conditions on transformation characteristics has been examined in 4695, 9395 and 8695 steels. These have a carbon content comparable to that in the case of commercially carburized steel of these types. The analyses of the steels are given in Table I. Each steel was an induction furnace heat, received as forged bars.

Prior structure is known to exert a potent effect on the transformation characteristics of austenite.¹ This is particularly true for austenitizing treatments that do not result in complete carbide solubility as is often the situation in high carbon steels or in the case of carburized low carbon steels. Thus, all three steels were reduced to a similar prior structure, free from grain boundary carbide precipitation and retained austenite. This was accomplished by austenitizing the bars at 1750°F and water quenching. To soften the steels and transform the retained austenite, 9395 was tempered at 1000°F for 70 hours, 4695 at 1100°F for 6 hours and 8695 at 1200°F for 3 hours.

Selection of the temperature range appropriate for the hardening of steel must be based on

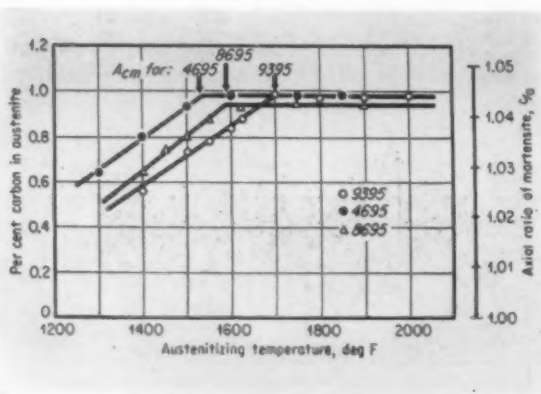


FIG. 1—Effect of austenitizing temperature on carbon content of austenite in steels studied.

information concerning the critical temperature range. For medium alloy steels of the type considered here, three temperature limits are of significance. These are the upper critical or A_{cm} temperature and the upper and lower temperatures defining the three phase, austenite-ferrite-cementite region. These temperatures are indicated in Table II.

When a hypereutectoid steel is austenitized at a temperature within the critical range, the composition of the austenite deviates from the analysis of the steel because of the presence of undissolved carbides. These carbides not only lower the carbon content of the austenite but also deprive it of important alloying elements such as chromium, molybdenum and to a lesser extent nickel. The carbon content of the austenite plays a major role in determining the transformation characteristics of the austenite. This is especially true in respect to martensite.

The influence of austenitizing temperature on the amount of carbon dissolved in the austenite was determined by the X-ray technique described by Troiano and DeMoss.² This method is based on the relationship between carbon content and the axial ratio of martensite formed from the austenite. Fig. 1 shows the influence of austenitizing temperature (1 hour at temperature) on carbon content of the austenite.

These data are a direct reflection of the influence of carbon content on the A_{cm} temperature. By choosing the upper temperature limit of the three-phase region (reported in Table II) as the eutectoid temperature, the eutectoid carbon content for these steels can be estimated from Fig. 1. These carbon contents are found to be 0.53 pct C for 9395, 0.71 pct C for 4695 and 0.61 pct C for 8695.

The influence of austenitizing time on carbide solubility was investigated at one temperature for each of the three steels. The results are presented in Table III.

The data of Table III reveal a surprisingly small, if any, increase in the carbon content of the austenite as the austenitizing time is increased from 1 to 16 hours. This implies that local equilibrium solubility is virtually complete in 1 hour. In view of the minor influence of

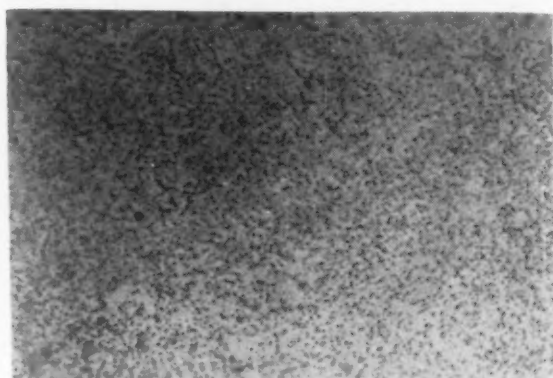


FIG. 2—Structure of 9395 steel held 1 hour at 1550°F, then quenched in water. Nital. 300X.

TABLE I

COMPOSITION OF STEELS WEIGHT PERCENT

| Steel | C | Mn | Si | Ni | Cr | Mo |
|-------|------|------|------|------|------|------|
| 9395 | 0.95 | 0.60 | 0.22 | 3.27 | 1.23 | 0.13 |
| 4695 | 0.95 | 0.58 | 0.24 | 1.79 | 0.0 | 0.25 |
| 8695 | 0.95 | 0.82 | 0.23 | 0.56 | 0.52 | 0.19 |

TABLE II

CRITICAL TEMPERATURES

Temperature, Deg F

| Steel | A_{cm} | Three-Phase Region | |
|-------|----------|--------------------|-------------|
| | | Upper Limit | Lower Limit |
| 9395 | 1700 | 1360 | 1240 |
| 4695 | 1530 | 1340 | 1270 |
| 8695 | 1590 | 1370 | 1340 |

TABLE III

INFLUENCE OF AUSTENITIZING TIME ON CARBIDE SOLUBILITY

| Steel | Austenitizing Temperature, Deg. F | Carbon content of austenite after | | |
|-------|---|-----------------------------------|---------|----------|
| | | 1 hour | 4 hours | 16 hours |
| 9395 | 1625 | 0.88 | 0.89 | 0.89 |
| 4695 | 1450 | 0.86 | 0.89 | 0.89 |
| 8695 | 1450 | 0.73 | | 0.75 |

time on carbide solubility, these results (1 hour austenitizing) may be transposed to commercial practice with confidence even where austenitizing times may be well in excess of 1 hour.

The austenitizing temperature will control the amount of undissolved carbide. A direct determination of the amount of undissolved carbide by the lineal analysis technique of Howard and Cohen³ was not feasible because of the extremely small particle size of the carbide phase.

This is apparent in the structure of 9395 austenitized at 1550°F which is reproduced in Fig. 2 and also in the structure of 8695 austenitized at 1525°F, shown in Fig. 3. The weight percent* of the undissolved carbide can be esti-

* Volume percent would differ only slightly since densities of cementite and ferrite are nearly the same.

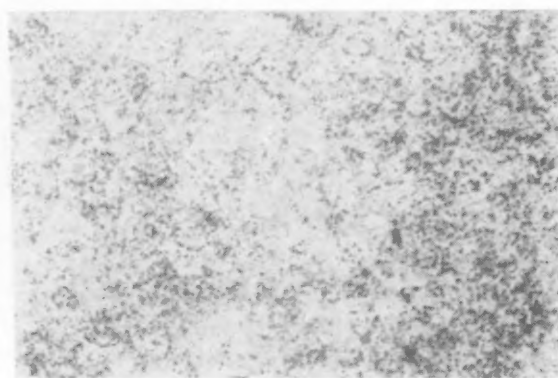


FIG. 3—Structure of 8695 steel held 1 hour at 1525°F, then quenched in water. Nital. 300X.

In commercial austenitizing practice, M_s temperature can be raised 100°F . . .

mated, nevertheless, by application of the lever law to the composition data presented in Fig. 1. The amount of undissolved carbide, calculated from the data of Fig. 1, is presented as a function of austenitizing temperature in Fig. 4. In the range of commercial heat treating practice (1400° to 1700°F), the amount of undissolved carbide generally is less than 6 pct.

The modification of austenite chemistry associated with austenitizing temperatures below A_{cm} creates major changes in the M_s temperature. Fig. 5 summarizes the influence of austenitizing temperature on M_s for 9395, 4695 and 8695. The M_s temperature is lowered as the austenitizing temperature is raised until the A_{cm} temperature is attained. Austenitizing temperatures above A_{cm} are essentially without effect on M_s . The slight rise in M_s at the highest austenitizing temperatures undoubtedly may be attributed to the grain size effect which was first observed in steel by Barnett and Troiano.⁴

Although undissolved carbides change both the carbon and alloy content of the austenite, their major influence on M_s is associated with the reduction in carbon content. This relationship between carbon content and M_s is illustrated in Fig. 6 which has been constructed from the data of Figs. 1 and 5. The separation between the curves for the various steels represents the contribution of alloy content to the M_s temperature.

Figs. 5 and 6 demonstrate that, within the range of commercial austenitizing practice, the M_s temperature can be raised by more than 100°F. This important aspect of heat treating practice may be reflected in a reduction in the residual stress state as well as the amount of austenite retained from the austenitizing treatment.

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4. W. J. Barnett and A. R. Troiano, "The Effect of Grain Size on the Martensite Transformation," Trans. AIME (1948), Vol. 175, p. 910.

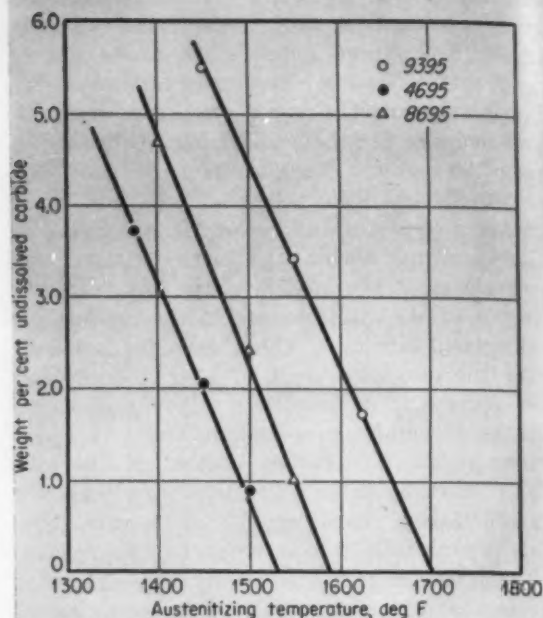


FIG. 4—Effect of austenitizing temperature on amount of undissolved carbide in steels studied.

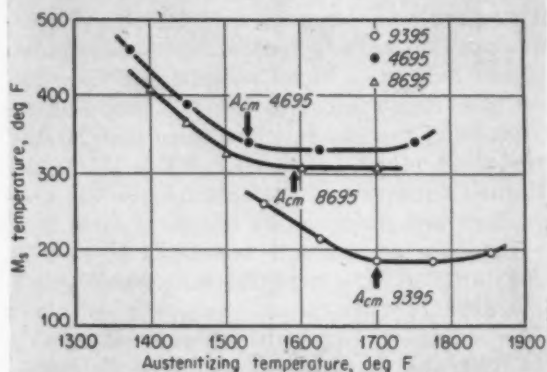


FIG. 5—Effect of austenitizing temperature on M_s point for 9395, 4695 and 8695 steels.

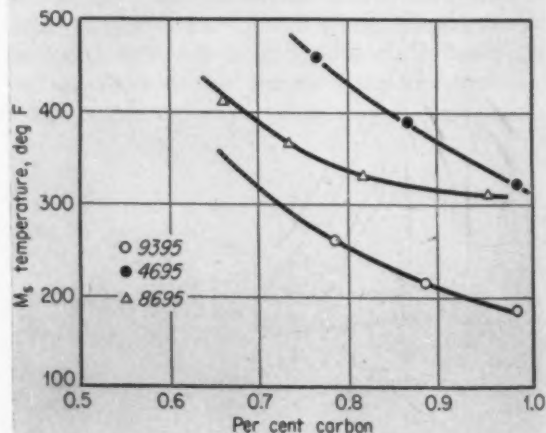


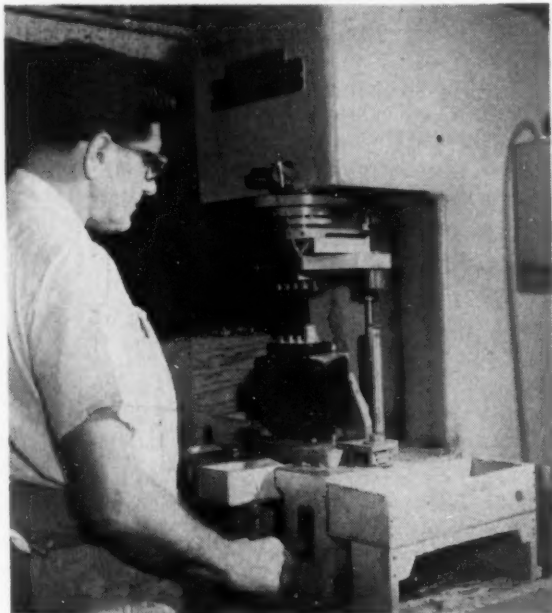
FIG. 6—Effect of carbon content on M_s temperature for the steels 9395, 4695 and 8695.

Light and mobile—

Small Hydraulic Presses Speed Parts Assembly, Cut Reject Rate

- ◆ A battery of nearly 100 small to medium hydraulic presses has reduced breakage and stepped up assembly of small toy parts . . . Preset pressure isn't affected by varying part dimensions, does the assembly job by squeezing action rather than sudden impact . . . Ramstroke is adjustable for minimum waste motion when job changes bring varying part dimensions.
- ◆ As assembly requirements change, presses are light enough for portability, can be moved to the work to cut part handling . . . Press action and motion of index tables can be adjusted quickly to match conveyor speeds . . . Operators approve of safety and noiseless features.

By W. A. Camuso, Methods Supervisor, Lionel Corp., Hillside, N. J.



VARIABLE wall thickness in transformer housing doesn't affect binding post fastening.

◆ **INSTALLATION** of nearly 100 small to medium size hydraulic presses has greatly increased production of toy assemblies at the Lionel Corp., Hillside, N. J. At the same time, the new machines have virtually eliminated breakage and other reject factors in processing a wide variety of small parts.

Many of these hydraulic units have replaced presses which, because of their fixed stroke could not adapt to variations in part dimensions. As a result, scrap losses were excessive. But the hydraulic stroke adapts itself automatically to thickness variations while continuing to exert a preset maximum pressure.

This is especially important in assembling toy components made of plastic, powdered metals and other materials. Such parts often vary considerably in thickness and other dimensions. They are easily fractured if the pressure and shock of a positive stroke exceeds that necessary for assembly. Also, with a fixed stroke machine, if accumulated part variations are on the low side, staking and similar operations may leave parts so loose that they fail to perform properly.

Mobility and flexibility of these presses is especially useful where assembly line is changed frequently to produce new models . . . Press and conveyor speeds quickly matched . . .

Hydraulic presses used in Lionel assembly operations were built by The Denison Engineering Co., Columbus, Ohio. Their stroke lengths can be altered quickly for minimum idle motion. Since the units are relatively light, compact adjustable and self contained, they can be easily moved about to do a variety of work.

This mobility and flexibility is especially useful where the assembly line is altered frequently to produce different models or sizes on long or short runs. Quick adjustment is also important in matching press and conveyor speeds for maximum production.

One delicate job now handled easily by hydraulic presses is that of applying plastic letters to toy parts. The process uses thin plastic ribbon and a heated die. This requires uniform pressure and timing to be effective despite variations in wall thickness which may occur on plastic or die cast car sides.

Another ticklish assembly involved forcing a steel train axle into a powdered metal wheel. The axle, which is knurled at each end, is placed inside a hollow punch and the wheel is located in a die below.

Pressure, application rate critical

Punch pressure forces the knurled section into the cored hole in the wheel hub. Unless the pressure and its application rate are just right, the wheel is likely to split. This job is done consistently with minimum breaking on a 4-ton hand loaded Denison press. The assembly also includes fitting a loose axle bushing between the wheel and a central shoulder.

A similar assembly is performed after two

shafts, with one wheel already in place on each, have been passed through holes in a truck frame. Two other wheels are placed in a die and pressed onto the exposed shaft serrations. The die is balanced to apply equal pressure on each wheel as the shafts are forced home.

Spacing between wheel flange faces in this operation has to be maintained within 0.0002 in. This is easily done since the hydraulic press maintains a preset maximum pressure and application rate.

Insure tight joints without breakage

Many of the firm's new presses are used to head hollow rivets or studs, some of them at both ends. In such operations, it is essential to insure tight joints without breakage despite some variations in part thickness. In former practice when total part thickness was on the high side, the resulting high pressure sometimes caused the part or even the die to break. And if parts ran thin, riveting would not always be secure.

In another application, sets of transformer laminations are assembled to a stamped bracket. This is done by setting two unthreaded tubular studs, each having an integral flange near one end, in a special 4-ton multipress.

Height of the stacked lamination often varies considerably when stock thickness is not uniform.

Since the new machine adapts itself to varying stack heights, studs are always headed with uniform pressure.

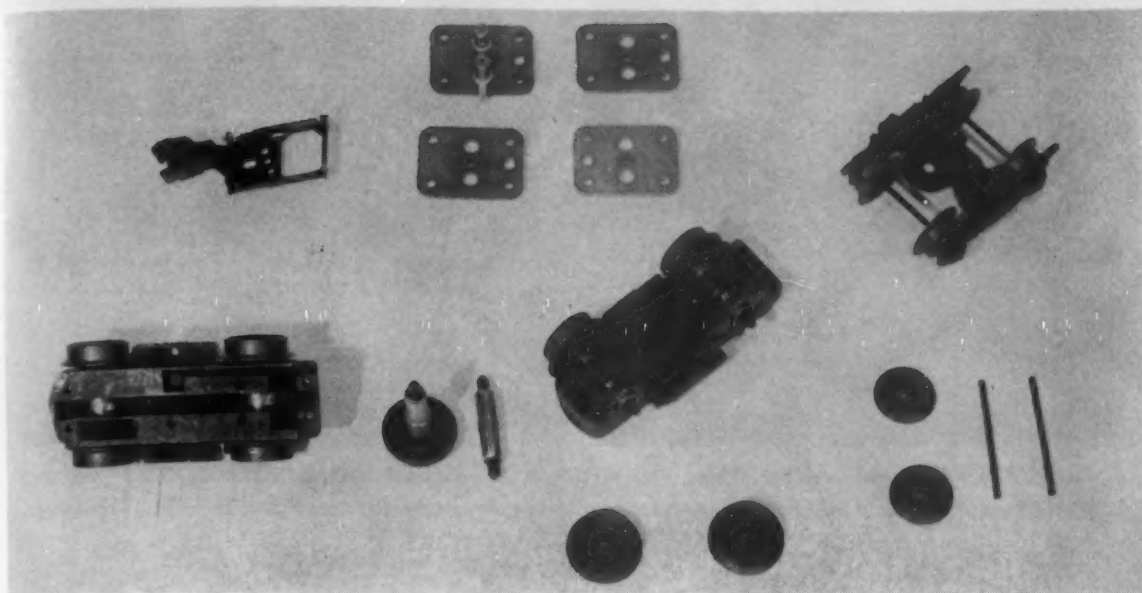
This special press is also used on other assemblies and is easily moved as required. This was impractical with the heavier and bulkier equip-



MIDGET press matches conveyor speed to do a 4-point staking job on train reversing units.



RAPID assembly uses two loaders to place several parts in six fixtures on dial table.



HYDRAULIC presses have cut breakage on assembling toy railroad parts such as these.

ment formerly used and caused excessive part handling.

Lionel transformer housings, are high-impact phenolic moldings having eight holes in a side wall whose thickness often varies from part to part. A flanged hollow binding post is fastened in each hole by a squeezing operation which also fastens a stamped common plate and some solder lugs in place. This is done readily, eight studs at a time, in the 4-ton Multipress. With former assembly practice, posts would be loose if the wall was below mean thickness and a cracked case was likely if the wall was too thick.

Volume jobs that are adaptable to index feeding are often so arranged, sometimes using two or more operators to load parts. For such work, Lionel uses three of the new 4-ton presses. Each has its own index table equipped with a rapid, accurate, shock-free Geneva motion.

One such volume job involves a zinc die cast coupler head which has an integrally cast rivet. A mating stamped part has a hole that fits over the rivet. These parts are hand loaded at the front of the index table which has six duplicate fixtures. The fixtures hold the parts in correct position for assembly. Table and press are positively interlocked hydraulically.

As each fixture pauses at the work station under the press ram, the ram lowers two punches. One punch heads the rivet and a second stakes a hollow end pin that forms the pivot for a tiny locking lever. Each of these three presses air eject 1000 assemblies an hour. They seldom produce a reject despite dimensional variations in parts. Safety is excellent since the operator's hands are always at the front of the index table.

In another six-station dial setup, two opera-

tors are necessary to load parts at the rapid dial speed chosen. In this assembly, the largest part is a stamped and pierced oblong bearing plate of laminated phenolic. Ring staking punches operated by the press ram fasten two brush holders and two solder lugs to this plate.

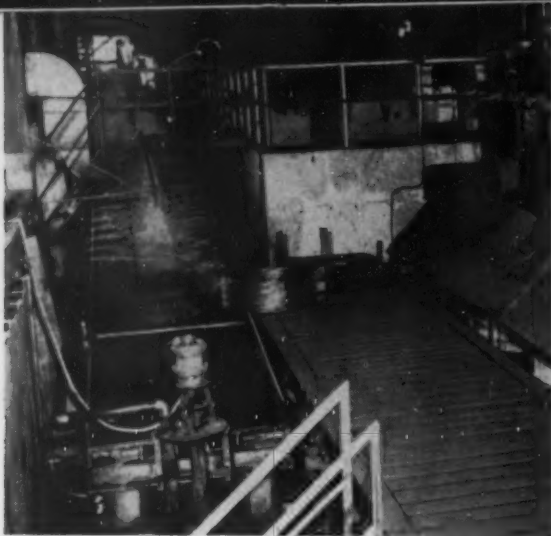
Although the plate has ample strength, it can be broken easily by too much impact or an excessive load due to variations in part size or thickness. Such breakage formerly ran high but with the hydraulic press, scrap is nearly eliminated, production is increased and quality is more consistent.

On still another job a special 4-ton 4-punch Multipress stakes a stamped bracket to two zinc die cast sections in assembling a train wheel truck. Slight variations in part thickness no longer make this job difficult.

Simple wooden fixtures used

Several Lionel assemblies involve many small parts which are put together as simple wooden fixtures advance on a continuous belt. Operators sit beside the belt and, at various stations, put one or more parts in place. When the assemblies are ready for staking, they are hand loaded in a standard 4-ton hydraulic press. The staked assembly is then set back on the moving belt fixture for the addition of other parts.

Finally, the units reach a 1-ton Denison midget press where parts are again placed, one at a time, in a staking die. Four punches complete the assembly by applying only 1000 lb total pressure. With the pressure preset and controlled, distortion is avoided. The assemblies are excellent, with almost no rejects.



AUTOMATIC RAM at end of high-speed slot conveyor pushes coils onto chain conveyor.



WIRE COILS undergo water quenching as they move along the double-strand drag conveyor.

Integrated line—

Automation Pays Off in Steel Mill Handling System

- ♦ A completely automatic steel mill handling system, consisting of four major components, moves coils of wire from the reels to storage and shipping . . . It includes a 240-ft drag conveyor, a coil transfer mechanism, a 1400-ft hook conveyor, and a coil unloader.
- ♦ Transfer of coils between the drag and hook conveyors is done with a special bobbing mechanism . . . An automatic water-quenching section is also built into the line . . . Chain used for the drag conveyor, being light in weight, allows greater live loads.

By **Walter Boehm**, Head, Automotive Section, Jervis B. Webb Co., Detroit

♦ **AUTOMATION** has moved into steel mill operation at Continental Steel Co., Kokomo, Ind. A completely automatic conveyor system was recently installed to handle coils of steel wire from the reels to storage and shipping. It consists of a 240-ft drag-type conveyor, a coil transfer mechanism, a 1400-ft hook conveyor and a coil unloader.

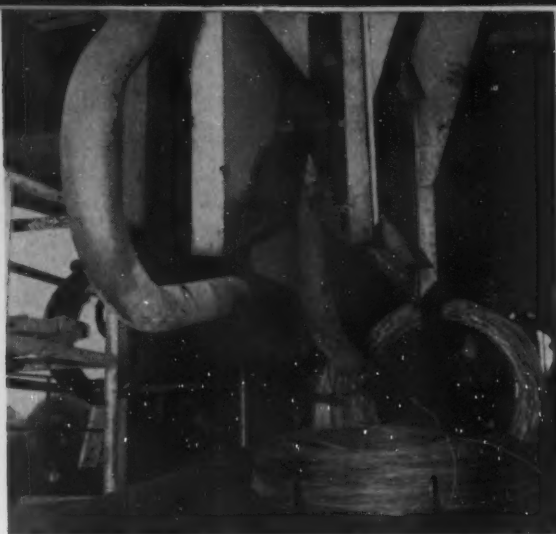
The system, designed and built by Jervis B. Webb Co., has a number of interesting features.

A special bobbing mechanism, for example, transfers coils from the drag conveyors to the hook conveyors. A water-quenching section built into the line works automatically. An unloader with six horizontal arms at the end of the line automatically indexes itself when each arm is filled with coils.

The drag conveyor, made in three sections, handles 630 lb of coiled steel wire every 20 seconds. It is powered by one drive at the head



CHANGING from double pusher-type dogs to single drag-type minimizes deformation of coils.



HOOKS tilt back to accept coils from chain conveyor as bobbing mechanism lifts them.

end and has an average speed of 30 ft per minute. The first section, a double-strand type, is about 135 ft long. It has fin-type dogs on 6-ft centers which push the hot coils on cast iron bed plates.

The second section is 75 ft long and has similar dogs spaced on 6-ft centers. However, this section is a single-strand type. The head end of the first section overlaps the tail end of the second section to facilitate coil handling.

Unlike the first section, the dogs in the second section engage the insides of the coils to drag them. By changing from the double pusher-type dogs in the first section, deformation of the hot coils is held to a minimum.

Coils transfer smoothly

Conveyor sprockets, mounted on adjustable hubs, transfer the coils smoothly from one conveyor section to another, and keep the coils in proper relation between the double and single dogs. Good chain track design eliminates coil marking at this transfer point. The dogs do not engage the coils as they pass over the sprockets.

The third section is a double-strand drag-type conveyor. It is about 30 ft long, and also has dogs located on 6-ft centers. The entire conveyor line has a total rise, of about 20 ft.

Chain used to drive the conveyor is a forged steel, heat-treated, rivetless type which allows quick replacement of links or pins. Its pitch is 9 in. Although its weight is only slightly more than half the weight of a block-type chain, it has equivalent strength.

Using a chain of lighter weight saves considerably in the amount of dead weight to be moved. In this case, the dead load being moved is about 60 pct of the live load. If block-link chain had been used, the dead load would have been greater than the live load and about 25 pct more power would have been required at the drive.

The drag conveyor receives coils from six laying reels or three pouring reels. The laying reels are located at the tail end of the first drag conveyor section. A slat conveyor, having a maximum speed of 240 fpm, transfers coils from the reels to the drag conveyor. It receives the coils by means of an electrically powered rack and pinion pusher from any of the laying reels which are parallel to the drag conveyor.

When the slot conveyor receives a coil, it moves it to the head end and stops. A pusher then transfers the coil onto the drag conveyor. This transfer operation is entirely automatic. Electrical interlocks prevent the pusher from operating unless dogs on the drag conveyor allow clearance for the coil to pass.

The pouring reels are located 135 ft from the beginning of the drag conveyor. Coils are pushed from the reels onto a holding table between the reels and the conveyor. Pushers, properly timed so that they do not interfere with the conveyor dogs, then move the coils from the holding table onto the conveyor.

Transfer of coils between the drag conveyor and the hook conveyor is accomplished by a heavy pivoted bobbing mechanism. This bobber is actuated by an adjustable cam mounted on the head shaft of the drag conveyor. It is mounted between the conveyor chains, and at the proper time, lifts the back of the coil. As soon as the hook enters a coil, the bobber drops in preparation for the next coil. Transfer is accomplished smoothly and automatically.

The hook conveyor is of the overhead type, using a 6-in. pitch, rivetless, heat-treated chain and ball-bearing trolley wheels, running on a 6-in. I-beam track. Hooks are suspended from two trolleys by a load bar. Each hook is equipped with a set of camming rollers which tilt the hook at the unloading station.

The conveyor itself is powered by two floating caterpillar drives. It is synchronized with the drag conveyor by a mechanical tie which con-

Unloader indexes arms to unloading position . . . Crane hook or ram tractor removes coils . . .

sists of a caterpillar chain engaging the hook conveyor chain, proper gear ratio, vertical shaft and coupling for the connection to the drag conveyor head shaft. The design of this conveyor permits change of elevation very readily to meet existing conditions.

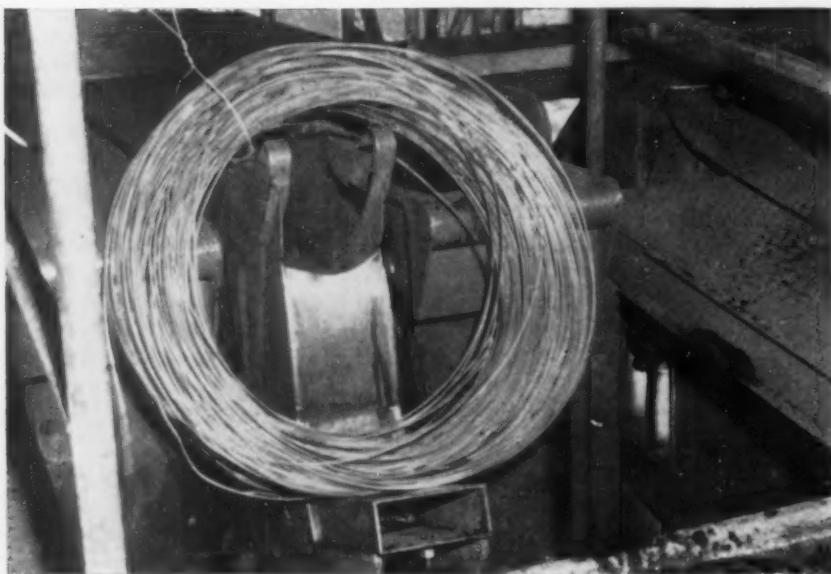
The automatic unloader at the end of the hook conveyor is an excellent example of the unusual self-unloading features of the system. This unit consists of a vertical shaft which rotates

six projecting horizontal arms. These arms are connected by pivot pins to a rotating head casting which in turn is keyed to the vertical shaft.

A vertical lever on each arm projects downward and is equipped with a cam roller running on a cam track. As the unloader rotates, the cam track causes the arm to rise to an angle of about 25° as it approaches the unloading station.

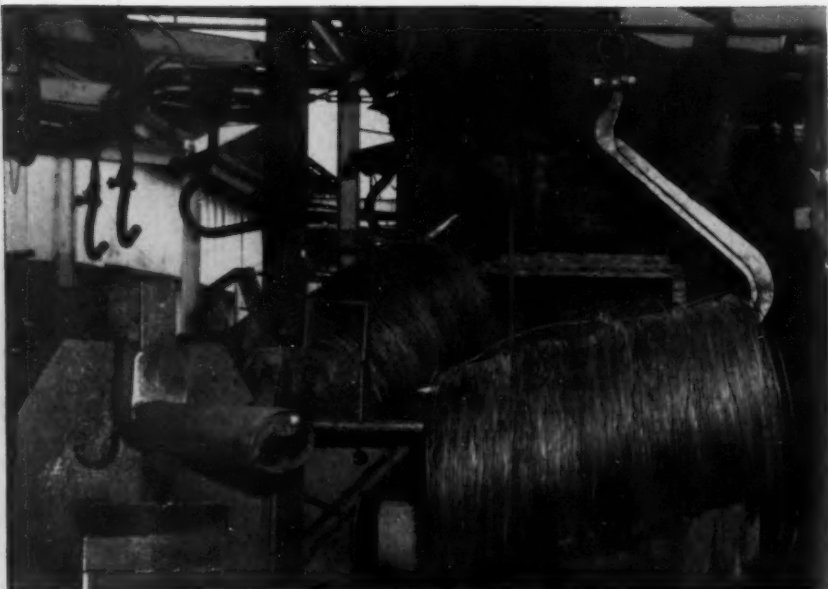
In the raised position, the arm receives a predetermined number of coils from the hook conveyor. The unloader then automatically indexes the next arm to the unloading position. Coils are removed from the arms either by crane hooks or a ram-type tractor.

Conveyors throughout the installation are equipped with direct-current motors. All are powered by a single motor-generator set. A great deal of flexibility is afforded by a variable-speed control on the motor-generator set.



BOBBING mechanism automatically raises coil as it is about to be picked up by hook conveyor.

CRANE HOOKS remove five coils at a time from unloader which then indexes to next arm.





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"DIE CASTING — How Else Would You Make It?" tells how designers are able to reduce costs and shape a better product by taking advantage of diecasting methods. This 16 mm color and sound film runs 35 minutes. American Zinc Institute, Inc., 60 East 42nd Street, New York 17, New York.

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"Clean Waters." A 25 minute, full color, sound motion picture calls attention to pollution of water

resources. The picture is designed to create an awareness to the growing problem of stream pollution. General Electric Co., Schenectady, 5, N. Y.

"Powered Industrial Trucks." This black and white film runs 25 minutes with narration and describes the development of the modern industrial truck. It is designed as a teaching aid for instructors of materials handling at the college level. Materials Handling Institute, Clark Bldg., Pittsburgh 22.

"Holding Power"—The Story of Bolts, Nuts and Allied Steel Fasteners. This 16 mm sound color film covers the entire manufacturing process from basic steelmaking to packaging of nuts and bolts. Sequences in the film demonstrate use of fasteners in home and industry, on the farm, in mines, on highways and railroads. Bethlehem Steel Co., Bethlehem, Pa.

"Federal Standard, Steel: Chemical Composition and Hardenability," a new government standard. Applies not only to steel purchased by the Defense Dept., but by all federal departments and agencies.

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"Higher Productivity in Manufacturing Industries," International Labor Office. Practical ways to increase productivity in manufacturing industries are presented. External and internal factors which appear to influence industrial productivity are listed and discussed. International Labor Office, Washington Branch, 1262 New Hampshire Ave., Washington 6, D. C. \$1.25. 195 p.

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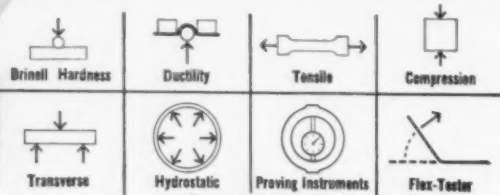
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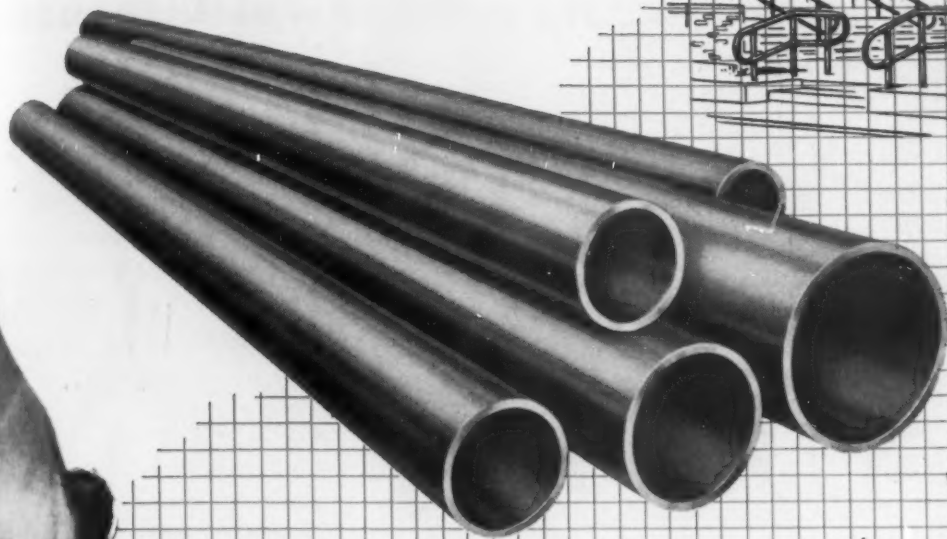
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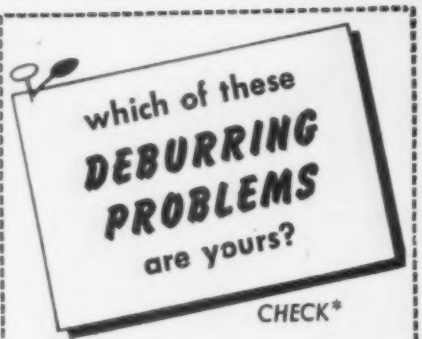
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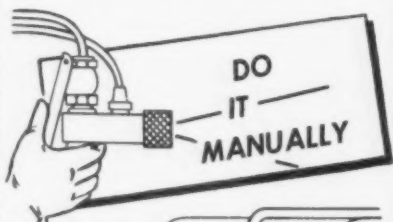
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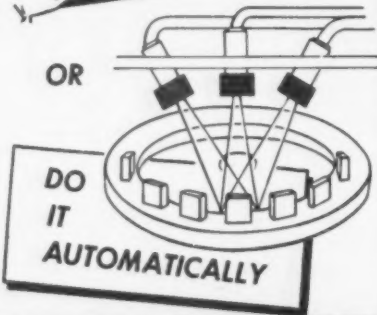
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New Technical Literature:

Threaded fasteners

The Unbrako precision threaded fasteners are covered in this new catalog. Stressed are the savings in costs and in delivery time these fasteners provide. Socket screw products are discussed. Other items covered are square head set screws, Dryseal thread pressure plugs, precision ground dowel pins and socket screw keys. Applications of each product are shown. Drawings show the features of each product. Specifications are included. *Standard Pressed Steel Co.*

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Roller bearings

The Tru-Rol line of cylindrical roller bearings is covered in this new catalog. Bearing types, sizes, dimensions and load ratings are listed. Featured are the "crowned" rollers, which relieve high stress areas at the roller ends. A formula for load ratings and a method of calculating expected bearing life, are included. *Rollway Bearing Co.*

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Ropeology

Ropeology, the handling of wire rope, is the subject of this bulletin. Shown are special boat slings, barge tow line, logging operation, cable assemblies, slings, and aircraft cable used on new super 18 Beechcraft and Boeing Jet Strato-tanker. *MacWhyte Co.*

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"Operation T-1"

Data on pressure vessel construction developed as a result of "Operation T-1" are given in this new booklet. "Operation T-1" is illustrated and described. The performance of T-1 Steel in other applications is also given. *U. S. Steel Corp.*

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FOR YOUR COPY

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, page 141.

Crane

The indoor-outdoor hydraulic crane is the subject of this new bulletin. Diagrams give working ranges, manual boom extensions, minimum aisle widths for turns, etc. Also described are attachments and special equipment. Specifications and performance data are given. *Austin-Western Co.*

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Extrusions

The aluminum extrusion process is described in this new circular. The extrusion process is explained and the advantages of the process are pointed out. The six basic extrusion types are described and illustrated. A table lists tolerances of the various types of extrusions. A specification table lists the physical properties and recommended applications for the 12 most generally used alloys. *Precision Extrusions.*

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Fact sheet

Octastrip 26, a paint and varnish stripper, is the topic of this fact sheet. This product strips epoxies, evaporates slower than water, and is non-inflammable. Applications include aircraft, railroad cars, trucks, autos, furniture, swimming pools and garage floors. *Octagen Process, Inc.*

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NEW IDEA

Catalogs & Bulletins

Metered mail

How metered mail can cut shipping costs is the subject of this booklet. Pictures compare human handling of mail with metered mail. Stressed is the economy of metered mail. Other Pitney-Bowes products are also shown. *Pitney-Bowes, Inc.*

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"Easy-On" caps

"Easy-On" caps and related necks are covered in this booklet. Engineering data are given. Facilities of the Eaton Mfg. Co., Stamping Div., are described. *Eaton Mfg. Co.*

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Pilot lathes

The H.E.B. Pilot Lathes are covered in this new leaflet. The automatic multi-cycling copying lathe is pictured and described. Specifications are included. *H.E.B. Machine Tools, Inc.*

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Broaching fixtures

Red Ring self-contained, air-powered bench-type broaching fixtures are covered in this catalog. Several different typical applications of the fixtures are shown. Drawings show part shapes. *National Broach & Machine Co.*

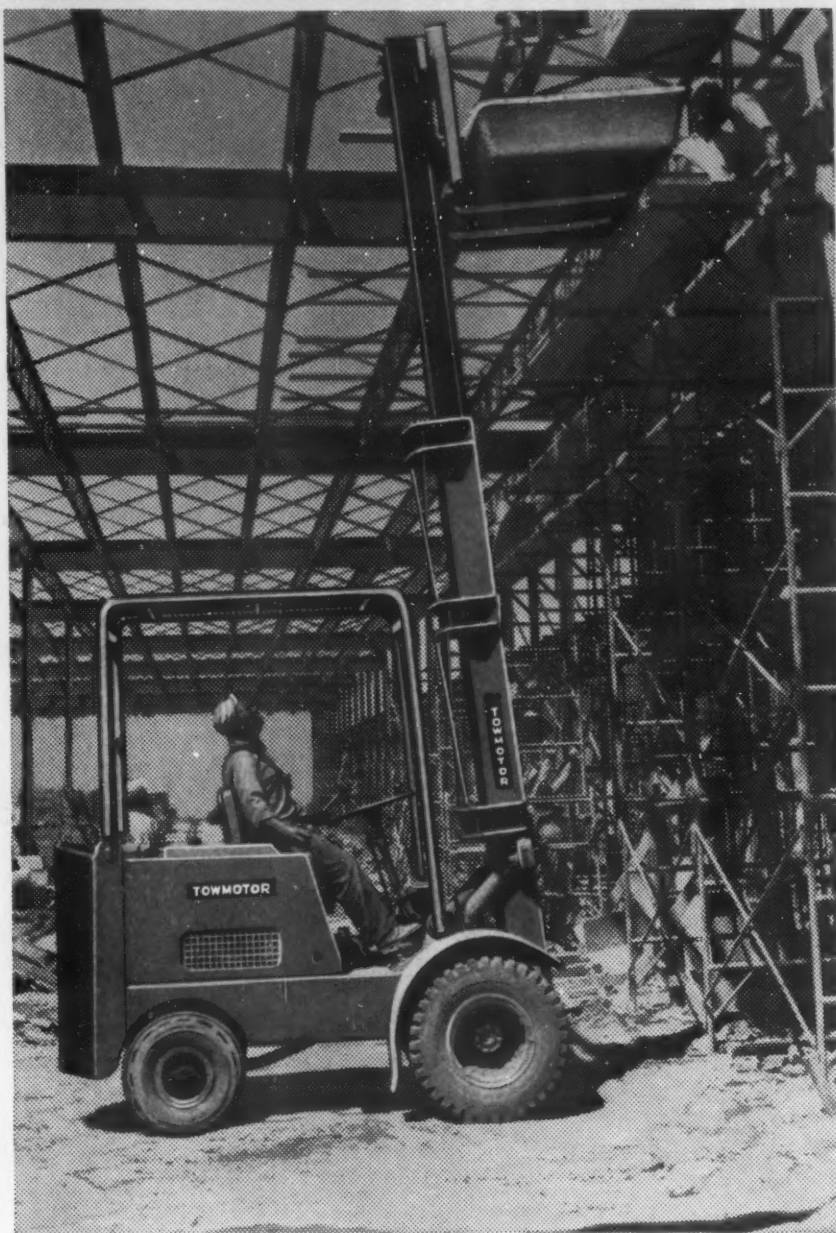
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Frozen mercury

Details of the frozen mercury process for producing larger and more complex precision castings are given in this new booklet. The complete story of the use and advantages of this process is presented for the first time. Advantages include closer dimensional tolerances, larger precision castings, more complex shapes, thinner-walled castings, and larger flat areas. A section is devoted to basic problems of producing complex and exacting parts. *Mericast Corp.*

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Turn Page



GOING UP... 1/2 ton of mortar!

Making light work of heavy lifting is Towmotor's job here . . . delivering a half ton of mortar to the work level in seconds. Your handling problem, inside or outside, can also be solved with Towmotor efficiency. Your nearby Towmotor representative is a materials handling specialist. Have him analyze your materials handling needs or write for special Job Studies covering *your industry*. TOWMOTOR CORPORATION, Div. 1511, 1226 E. 152nd St., Cleveland 10, Ohio.

TOWMOTOR

THE ONE-MAN-GANG

®

FORK LIFT TRUCKS and TRACTORS
Since 1919

November 11, 1954

139

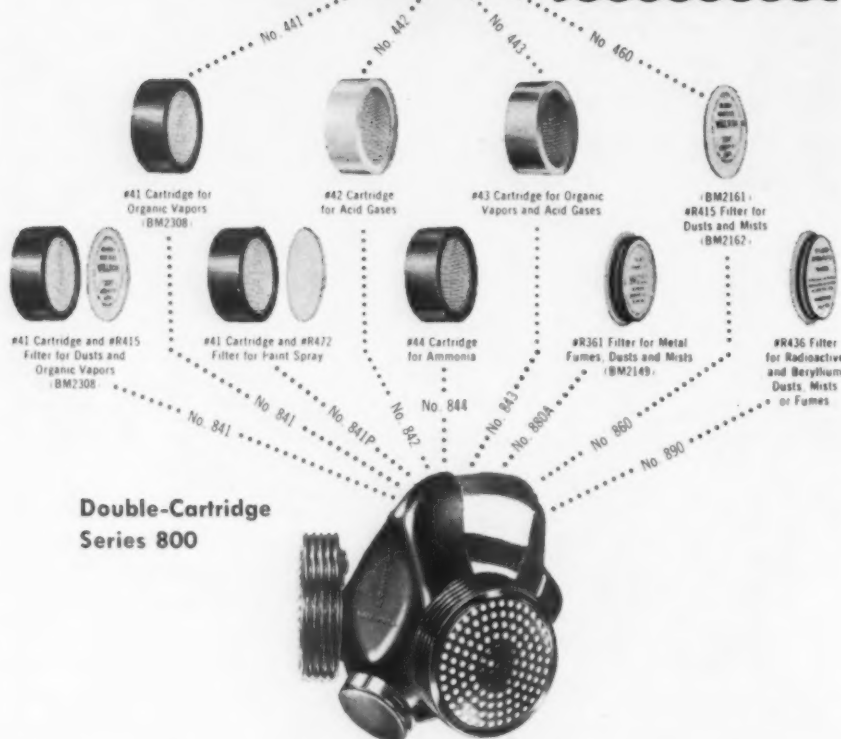
NOW... WILLSON INTERCHANGEABLE RESPIRATORS

IN BOTH SINGLE AND DOUBLE CARTRIDGE STYLES!

Single-Cartridge
Series 400



NOTE: The cartridges and filter shown for use in the Series 400 single-cartridge respirator are exactly the same as those used in the Series 800 double-cartridge respirator and can be used interchangeably in both. The other five cartridges, filters, and combinations are recommended for use only in the Series 800 respirator.



Double-Cartridge
Series 800

These Willson Respirators are the first truly interchangeable types in the field. Neither style requires additional parts or accessories to make use of the cartridges, filters, or combinations indicated to be used with them.

Write for bulletins describing these new Willson Interchangeable Respirators. Standardizing on them will give you the respiratory protection you want and simplify your inventory as well.



WILLSON PRODUCTS, INC., 231 Washington Street, Reading, Pennsylvania

FREE TECHNICAL LITERATURE

Relay

A hermetically-sealed sub-miniature relay for electronic applications in aircraft, aboard ship, and on portable units is described in this new bulletin. Information on the relay's performance features, construction, and operation is given. *General Electric Co.*

For free copy circle No. 13 on postcard, p. 141.

Valves

Design advancements in the 600 and 880 series of hand and foot valves are described in this new bulletin. The bulletin describes the valves in detail. Installation data, parts lists and enlarged views of the valves are included. Specifications are included. *Ross Operating Valve Co.*

For free copy circle No. 14 on postcard, p. 141.

Air tool catalog

Air tools are covered in this new catalog. Among products discussed are screwdrivers, nutsetters, accessories, impact wrench, rotor chipers, scalers, grinders, wire brush machines, and drills. *Rotor Tool Co.*

For free copy circle No. 15 on postcard, p. 141.

Frictionless hook scale

The frictionless hook scale is the topic of this new leaflet. Features listed include high guaranteed accuracy, light weight, adjustable gauge, lens-actuator-type load cell, low headroom loss, and dual-range dial. *Martin-Decker Corp.*

For free copy circle No. 16 on postcard, p. 141.

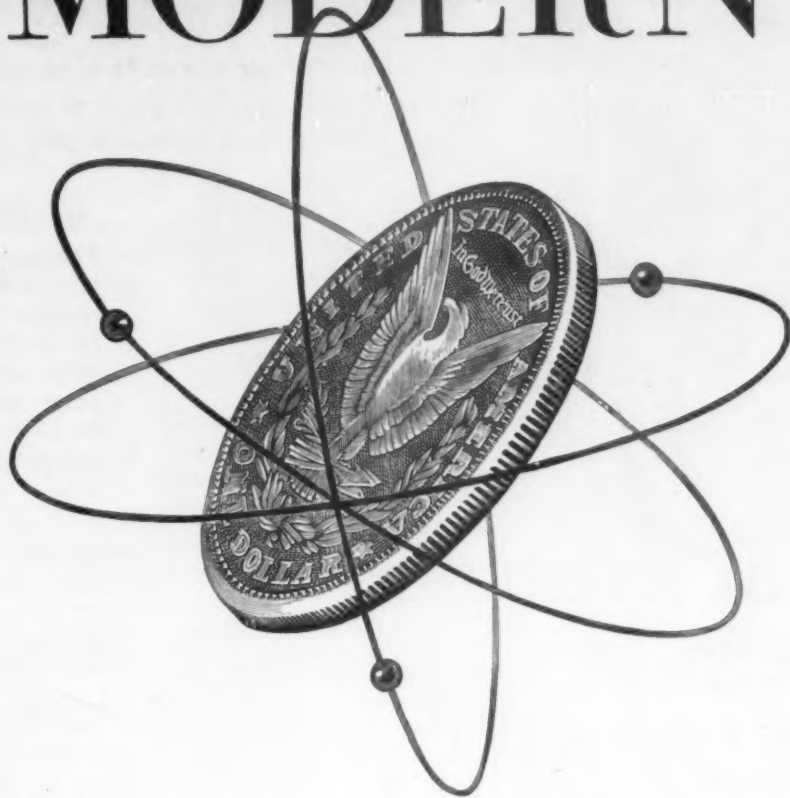
Cylinder manifolds

The part of the National Welding Equipment Co.'s "National Notes" which covered cylinder manifolds are now available. Among topics discussed are what a cylinder manifold does, the "center section," relief valves, the individual pigtail section, and master control valves. Illustrations give further information. *National Welding Equipment Co.*

For free copy circle No. 17 on postcard, p. 141.

Turn Page

MODERN



Throughout the 48 states and in many foreign lands, large and small companies in hundreds of industries use the modern banking services provided by New York's first bank. Our Commercial Department offers every up-to-date facility, backed by a century and a half of experience in meeting the banking requirements of American industry.

You will find this Bank alert to your needs, progressive in outlook and resourceful in seeking solutions to your banking problems.

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November 11, 1954

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For Stampings
...look for the **PLUS**
beyond
the **PRICE!**



Ever think what it costs when the stampings you ordered keep falling below your specified AQL? Steady unvarying conformance with AQL requirements, with minimum rejects — established over an excellent 39-year record — is just one of many plusses you get when you buy Detroit Stampings.

Look for the Plusses *beyond* the price the next time you buy stampings!

*And be sure to try **DETROIT***

DETROIT STAMPING COMPANY



345 Midland Ave. Detroit 3, Mich.

"America's Best-Known
Jobbing Stampings Manufacturer"

TECHNICAL BRIEFS

CONSTRUCTION: New Method

Builders save on costs through use of metal framework equipped with casters in place of usual scaffolding . . . Lock mechanism eliminates bolting, need for special tools.

A new shoring technique that uses complete integral scaffolding equipped with casters has eliminated the need for knocking down scaffolds and forms and reduced rebuilding of forms at other locations on the building site.

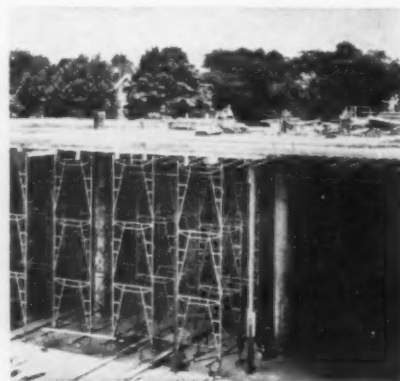
This method, using Universal Ezebilt scaffold panels, was pioneered and built by the Universal Mfg. Corp., Zelienople, Pa., and adapted to mobile integral units, engineered to contractors' specifications.

Eliminates Bolting

The similarity and height of bays and the size of a new Distribution Center building for Western Electric Co. in Pittsburgh, Pa., being built by the Mellon-Stoort Co., permitted the economical use of rolling scaffold-shoring.

In laying the 250 x 400 ft ceiling over the first floor, each shoring unit was simplified by erecting three parallel 50 ft runs, braced with Universal's Gravity-Lock mechanism which eliminated bolting and the need for special tools.

These runs, equally spaced between columns, tied together with pipe and clamps, supported a form area 50 x 25 ft. This was poured



Rolls on casters . . .

WANT MORE DATA?

You may secure additional information on any item briefed in this section by using the reply card on page 141. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

with 8 ft square, 7½ in. drop heads on 25 ft centers. The rigid shoring units were mounted on screw jacks to raise the forms to exact height of 22½ ft, carrying a total load of 195,000 lb including estimated live load.

The unusual feature of this scaffold-shoring job was the addition of runners with 6-in. casters to the scaffold units. After the 8½ in. thick concrete slabs were poured and cured, the unit was lowered on screw jacks.

Diecasting:

Die cast threads cut costs, improve quality of product.

A cost reduction in excess of 25 pct plus substantial improvements in strength and uniformity has been achieved through use of a zinc diecasting to form the threaded pressure sealing ring for a pressurized dessert topping dispenser.

Diecast Threads Uniform

Formerly this part was made of aluminum and the internal thread was machined. This construction lacked sufficient strength to withstand the torque required in assembling the dispenser to insure positive sealing. The machined threads also lacked uniformity and sometimes created assembly problems.

The new design is cast of Za-

mak-3 zinc alloy by Tool-Die Engineering Co., Cleveland, for Aeration Processes, Inc., Columbus, Ohio. The 2 7/8 in. diam. inside thread is now cast as an integral part of the ring. The 41,000 psi tensile strength of Zamak-3 is sufficient to permit the required sealing torque.

Since diecast threads are uniform from one piece to another, assembly operations are simplified. Three torquing lugs are also diecast on the O D.

The parts are cast in a two-cavity die having cores that unscrew and push the castings out of the die. This yields clean, precise threads. Because of shrinkage which begins as soon as the metal enters the die, cast solid female threads are practical. In general, this can only be accomplished in zinc and lower melting alloys. An additional advantage of the cast threads is that they can run fully against the inside shoulder. This permits use of a shorter part, saves material.

Spotwelding:

Unique rig permits handling of unwieldy sections.

A rig that suspends a part from its center of gravity while being spot welded has eliminated many man hours and has speeded spot welding operations for one aircraft manufacturer.

Unwieldy, multi-contoured aircraft assemblies have been troublesome problems for spotwelding machine or riveting machine operators. Some assemblies required two or more men to hold them during the operation.

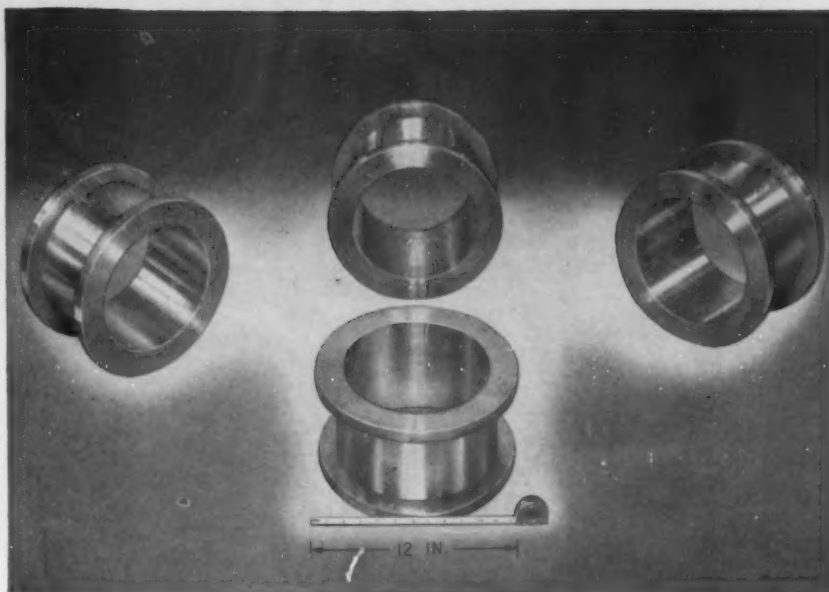
To achieve faster production at reduced labor cost, Martin Aircraft, Baltimore, Md., has developed a



Easy to handle . . .

Turn Page

November 11, 1954



Forged Sleeves: 12 1/4" OD x 9" ID x 6 1/4" long

for complete service

G. O. CARLSON, INC.

**forged and rough machined
these stainless steel sleeves**

Producing stainless steel forgings is not easy. That is why many plants turn this work over to the experienced personnel of G. O. Carlson, Inc. The forgings illustrated are special sleeves made of Type 302 stainless, formed first as rings and then rough machined in the Carlson machine shop. Products such as these forgings are made at substantial savings because Carlson's technical knowledge, practical skill and specialized equipment combine to do a faster job with less waste of valuable material.

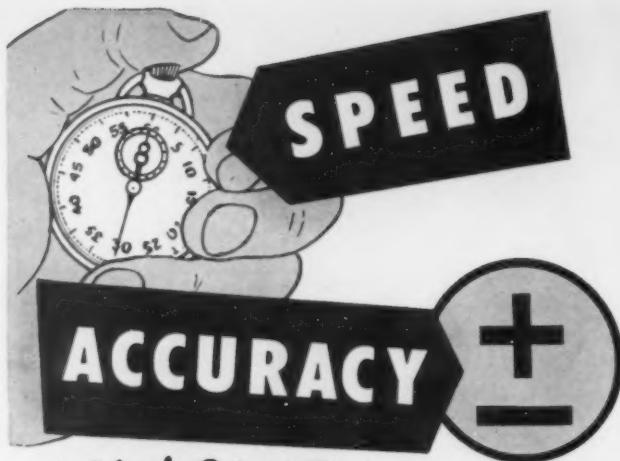
Forgings, heads, diameters, rings, plates and other stainless steel specialties are regularly made by us to meet the most rigid chemical industry standards.

Contact G. O. Carlson, Inc. for your needs in stainless steel.

G.O. CARLSON, INC.
Stainless Steels Exclusively
Plates • Plate Products • Forgings • Bars • Sheets (No. 1 Finish)

THORNDALE, PENNSYLVANIA

District Sales Offices in Principal Cities



LOW COST OPERATION

That's your assurance when you use Dietert-Detroit Control Equipment . . . Products that have gained a world-wide reputation in meeting present-day production requirements.

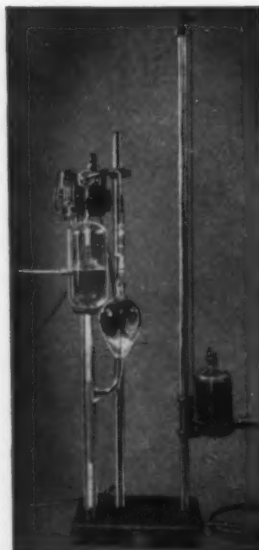


THREE-MINUTE SULFUR DETERMINATOR

The Dietert-Detroit Sulfur Determinator is designed on the basis of utility, speed, simplicity and neat appearance. It offers extra convenience, reliability and low operational cost . . . Used with the Varitemp or Hitemp Combustion Furnace it provides the most practical and accurate means of sulfur determination of COAL, COKE, IRONS, ALLOY STEELS, NON-FERROUS METALS, RUBBER, PETROLEUM PRODUCTS and other organic or inorganic materials in as little as a three-minute period.

TWO-MINUTE CARBON DETERMINATOR

This Dietert-Detroit Carbon Determinator provides a quick, accurate, quantitative determination of carbon in metals and other materials within two minutes after the sample is prepared and weighed . . . The samples may be BORINGS, MILL CHIPS, CRUSHED SAMPLES, PELLETS, SHOT or CAST PENCILS from a specimen mold . . . The carbon percentage is read directly on the graduations of the burette without calculation. Over 3000 users appreciate its special superior features and simplicity of operation.



Let our Determinators supply the answer to your analytical problems. Write TODAY.

handling rig that suspends an assembly part at its center-of-gravity. In this position the part is completely free swinging and easily handled by one man. Small parts are hung from an overhead crane. Large parts are mounted at the center-of-gravity on an arm built out from the base of the machine.

Coating:

Dip process coats ferrous alloys or aluminum alloys.

High temperature oxidation of mild or low alloy steels can now be largely prevented by a new coating process which metallurgically bonds pure aluminum or its alloys to ferrous metals.

The Alumicoat process is available for processing either large or small articles in production quantities in a new plant recently built for the Arthur Tickle Engineering Works Inc., Brooklyn, N. Y.

Pure aluminum has been found to offer the best resistance to the attack of industrial gases and corrosive media, especially those containing sulphuric compounds. The aluminum penetrates the steel to a depth of 0.0015 to 0.002 in. and approximately 0.0005 to 0.001 in. aluminum remains as a protective coating on the surface.

Replace High Alloy Steel

High temperature oxidation of mild or low alloy steels can be stopped or materially reduced. In many cases, high alloy steels can be replaced with less costly low alloy steels which are coated to resist oxidation and corrosion.

Tests have shown that adequate



Coat parts in bath . . .

Turn Page

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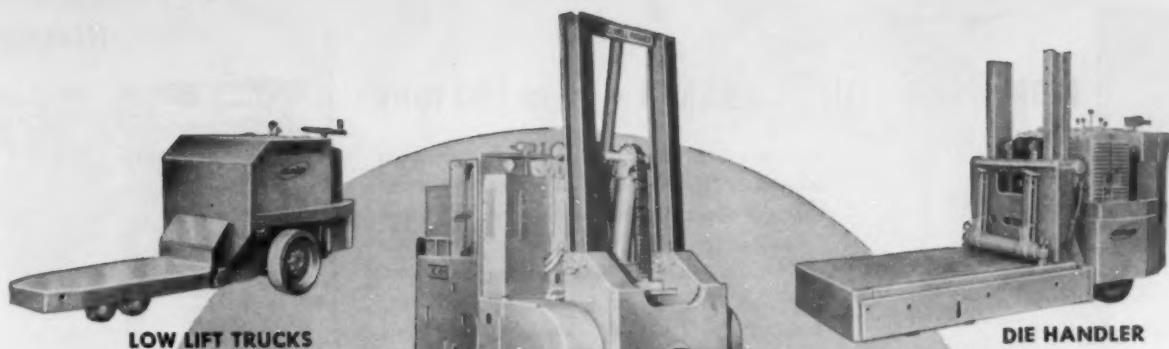
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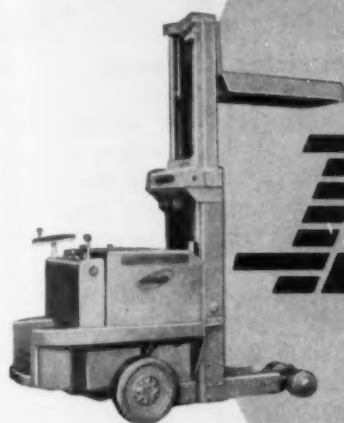
IRON AGE



LOW LIFT TRUCKS

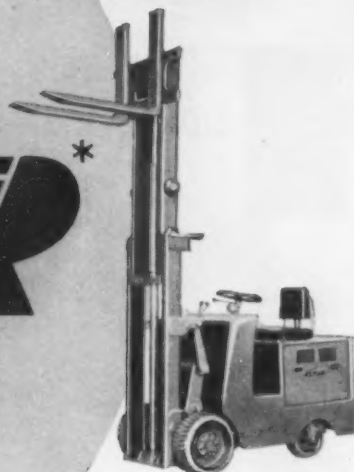
RAM TRUCK

DIE HANDLER



HIGH LIFT TRUCKS

ELPAR



FORK TRUCKS



COMBINATION
LOW LIFT AND CRANE



CRANES

Plus Values of **ELPAR** Trucks:—

- Over 100 models of *ALL* types—fork, low lift and high lift platform, crane.
- Pennies per day to operate due to quiet, fume-free ELECTRIC power.
- Packaged unit design assures instant accessibility for preventive maintenance.
- 48 years' experience designing SPECIAL trucks for unusual load or operating problems.

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Get all the facts **FREE**

Illustrated Catalog
tells why ELPAR gives
you more for your truck
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The ELWELL-PARKER Electric Co.
4299 St. Clair Ave., Cleveland 3, Ohio

Please send your ELPAR Truck Catalog.

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Company _____

Street _____

City _____ Zone _____ State _____

NORTHERN SUPER CRANES • UP TO 150 TONS

Northern Super Cranes—since 1899—have been moving endless tonnages of material in thousands of plants in the United States and other countries. For safety, durability, precise manipulation, unsurpassed electrical equipment, minimum maintenance and maximum dependability in heavy duty service, many plant managers have installed Northern Cranes exclusively.

Write for Bulletins SE-108-A and G-700

NORTHERN HI-LIFT CRANES • UP TO 20 TONS

Northern Hi-Lift Cranes are intended both to supplement Northern Super Cranes in heavy duty service and to provide economical work handling in lighter service. They have the same engineering features as Northern Super Cranes—low design stress for safety—high grade steels, turned and ground shafts and press fits for durability—highest quality electrical equipment and controls for dependable operation.

Write for Bulletin HL-115-R

NORTHERN HI-LIFT HOISTS • 2 TO 15 TONS

Northern Hi-Lift Hoists are heavy duty type electric hoists, designed especially for low headroom installations. They feature heavy duty roller bearings, extra heavy bearing shafts accurately press fitted with bearing races, extra large independent mechanical and electric brakes, and many other elements required in a good investment in hoist equipment.

Write for Bulletin H-112

NORTHERN TRAVELATORS • FOR LIGHT CRANES

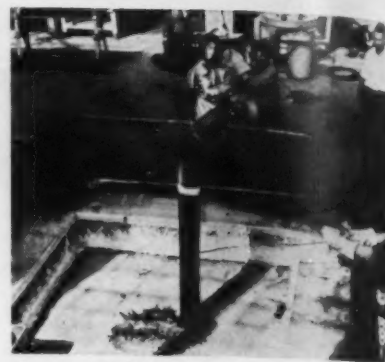
The Northern Travelator is a bridge drive unit which can be applied to a hand traveled crane to convert it to power travel. It can be easily installed by your own mechanics and electricians in a few hours time. The roller chain drive facilitates installation and provides longer life and greater ability to absorb the usual impacts of crane service.

Write for Bulletin T-105

NORTHERN CRANES—HOISTS—TRAVELATORS

NORTHERN ENGINEERING WORKS

210 CHENE ST., DETROIT 7, MICH.



Impurities removed . . .

protection against oxidation is achieved at temperatures at least as high as the base metal has useful strength. Tests have been made with low carbon steel which have exceeded 1900°F.

At temperatures exceeding the melting point of aluminum, the aluminum diffuses into the steel forming an intermetallic compound of iron and aluminum. This diffused coating provides a refractory material that gives the steel maximum protection against high temperature scaling.

In preparing metal parts for processing, the areas to which pure aluminum or an aluminum alloy are to be bonded are first thoroughly cleaned. Areas not to be coated are masked off. Next the metal is fluxed in a salt bath by treating the cleaned parts with a patented salt bath process.

Foundry:

Reclamation unit cuts sand expense, solves supply problem.

Equipment recently installed for reclaiming steel foundry molding sand at the Torrance, Calif., plant of The National Supply Co., is expected to save this company more than \$40,000 a year if production of castings is maintained at 400 tons per month. Savings were compared with an investment of \$55,000 in the process equipment.

Molding sand used in the production of castings comes from the reclaimer unit. New sand is added to the core sand to replenish losses through handling shot blast and dust collection system.

Used sand is fed by a belt con-

Turn Page

**"7,125 men and women
signed up to join those
already saving for their
financial security..."**

GEORGE H. COPPERS

*President,
National Biscuit Company*



"There is no greater honor than partnership in an enterprise as important to a nation as the Payroll Savings Plan for United States Savings Bonds. We view our recent person-to-person canvass of employees in behalf of Bonds as practical patriotism. It supports our Government's efforts to stabilize the value of the dollar. The campaign also benefited our employees. 7,125 men and women signed up to join those already saving for their financial security in this easy, automatic way."

The Payroll Savings Plan is the backbone of Series E Bond Sales. 8,500,000 employees in more than 45,000 companies invest more than \$160,000,000 in Savings Bonds every month.

The person-to-person canvass is the keystone of The Payroll Savings Plan. In company after company person-to-person canvasses conducted by employees have increased participation to 60%, 70%—even 90% plus.

Why don't you conduct a person-to-person canvass in your company? Here are two, simple steps:

- Tell the Savings Bond Division, U.S. Treasury Department, Washington, D.C., you want to conduct a person-to-person canvass, they will show

you how easy it is to install the plan.

- Over your signature tell your men and women you are 100% behind the Payroll Savings Plan because it enables them to build personal security . . . it is a check on inflation and helps to stabilize the dollar . . . it has set up a reservoir of reserve purchasing power—over \$37.5 billion—the cash value of Savings Bonds held by individuals at the end of July, 1954. The greatest reserve of purchasing power this or any other country has ever had.

Your phone call, telegram or letter to Savings Bond Division, U.S. Treasury Department, Washington 25, D.C., will bring prompt co-operation from your State Savings Bond Director. Act today.

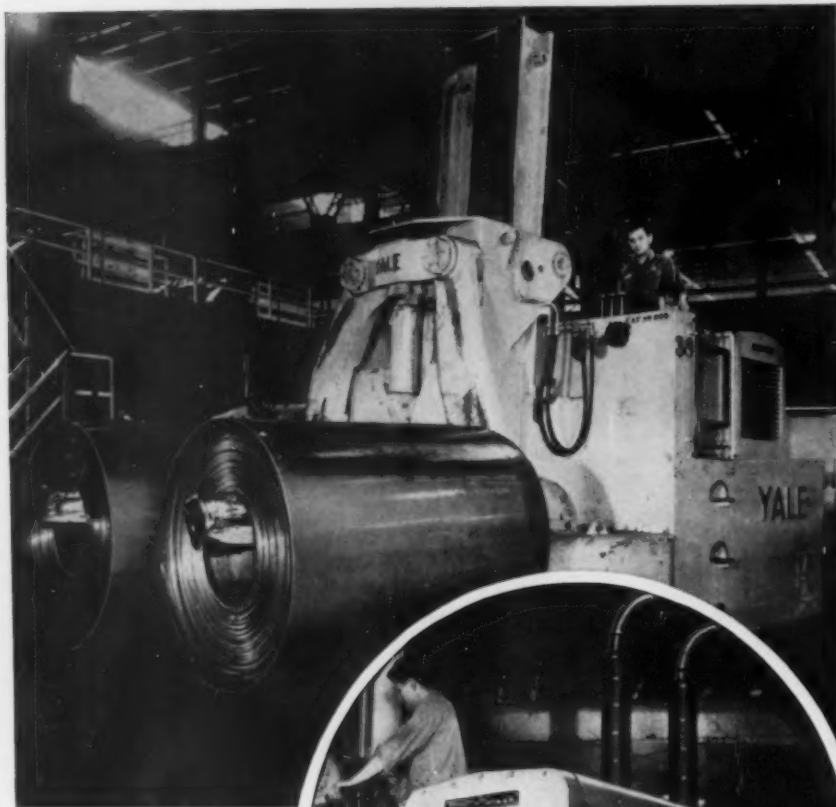
The United States Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the Advertising Council and

The **Iron Age**



Ready-Power Continuous-Duty DIESEL ELECTRIC

POWERS INDUSTRY'S LARGEST LIFT TRUCKS



**AMAZING
DURABILITY!**

**UNBELIEVABLE
ECONOMY!**

This 80,000-lb. twin ram lift truck, operated in one of America's largest steel mills, is equipped with interchangeable Ready-Power diesel electric model RD-18. Continuous duty full power is assured *at all times*. The low operating and maintenance costs attained are possible only through the use of diesel-electric drive. Ready-Power offers a full range of diesel electric and gas-electric models for all truck sizes. *Write for complete information.*

READY-POWER

The READY-POWER Co., 3822 GRAND RIVER AVE., DETROIT 8, MICH.

Manufacturers of Gas and Diesel Engine-Driven Generators and Air Conditioning Units; Gas and Diesel-Electric Power Units for Industrial Trucks

TECHNICAL BRIEFS

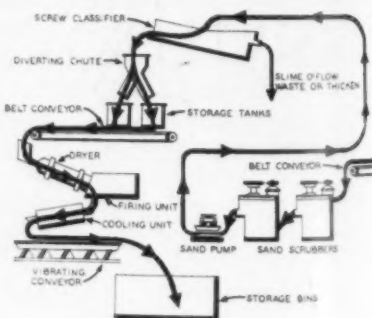
veyor into two sand scrubbers. Water-entrained sand is then pumped to a screw conveyor or classifier to free the sand of water and slime overflow waste. This is then fed by the classifier into temporary storage tanks. A belt conveyor under these tanks carries the wet sand to a dryer with a firing unit at its far end. Sand moves from there through a cooling unit and over a vibrating screen conveyor to storage bins.

Maintenance Problem Solved

Several changes were made in the equipment and the methods of operation before satisfactory results were obtained. Calcining, which required 1100°F heat, was abandoned when it was found that the carbonaceous coating on the sand grains exerts little influence upon casting behavior or mold properties of the rebonded, reclaimed sands when used as mold facings.

This solved maintenance problems and helped to solve a cooling problem. The temperature of the firing unit was dropped from 1500° to 400°F. Without calcining, the carbon content of the sand has never exceeded 0.11 pct.

Further reduction of temperature was provided in the cooler by installation of mist or fog cooling. This equipment consists only of a water pipe with a large number of fine holes. Water introduced in this way does not wet the sand. Another change was replacement of the original rake classifier by a screw conveyor in order to reduce the amount of water carried into the hoppers. Over night storage in these hoppers also reduces water content to about 10-12 pct.



Sand unit layout . . .

Turn to p. 154.

BRIEFS

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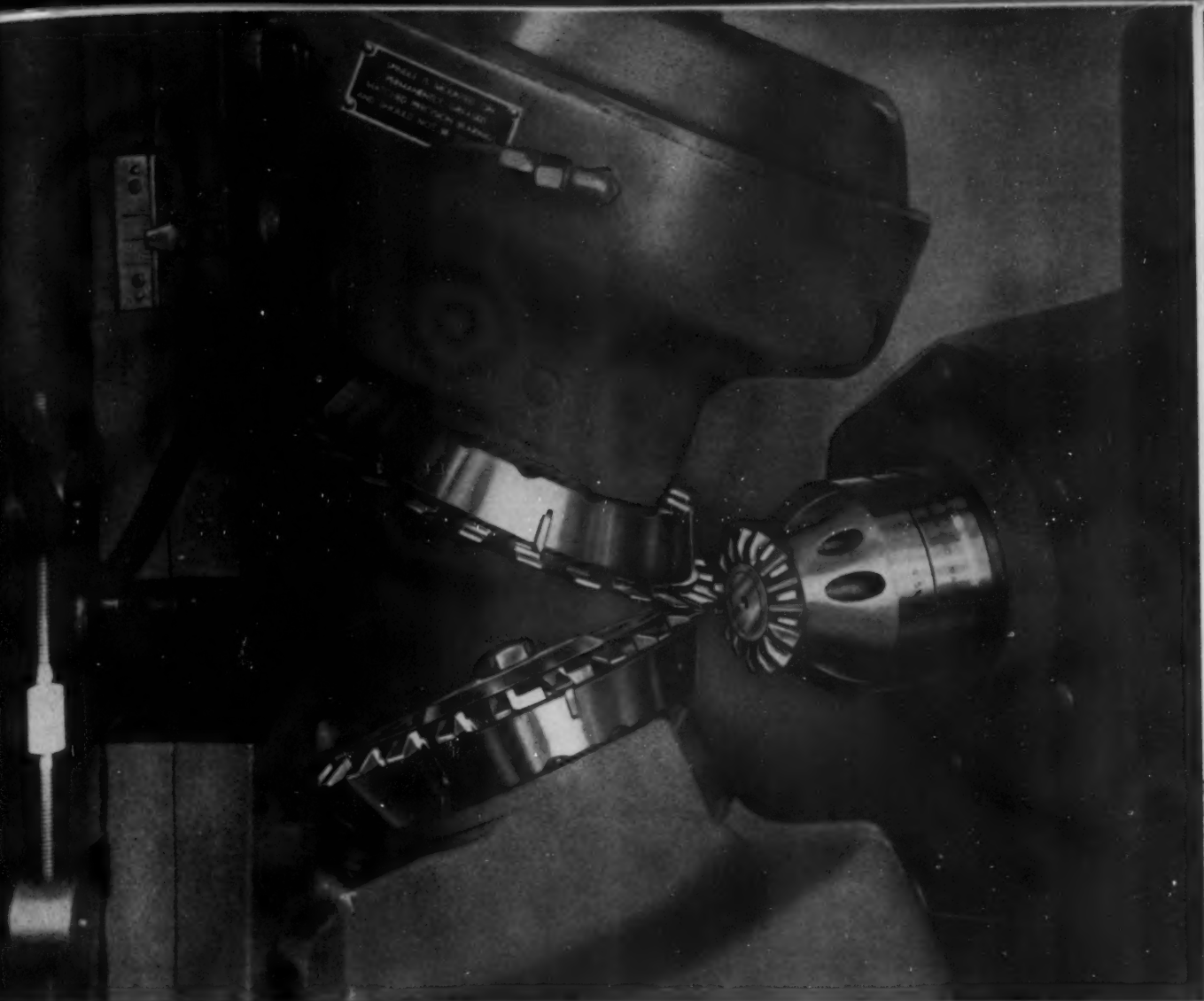


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IRON AGE



How to multiply production of straight bevel CONIFLEX® gears and pinions *by as much as 500%*

You can do it with the new No. 104 Straight Bevel CONIFLEX Generator.

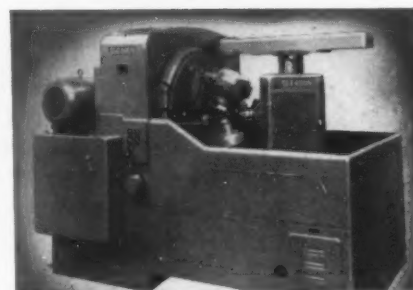
The two interlocking disc-type cutters, with 24 blades each, *complete a gear in one rapid operation.*

This is the key to the remarkable performance of this new Gleason machine which achieves production rates up to 5 times as fast as any previous generator. In addition, a

new generating method insures high efficiency, excellent finish, and maximum cutter life.

The range of capacity, and the ease of setup, make the No. 104 Straight Bevel CONIFLEX Generator ideal for jobbing.

Calculations have been reduced to a minimum and can be done long hand or with slide rule.



The No. 104 Straight Bevel CONIFLEX Generator completes gears up to 8½" diameter and 1⅜" face width, and from 20 to 3 DP.

We will be glad to send a bulletin giving further details on request.

® Straight bevel gears with localized tooth bearing.



GLEASON WORKS

Builders of bevel gear machinery for over 85 years

1000 UNIVERSITY AVE., ROCHESTER 3, N. Y.



"Thinness Control" means that the decimal thickness of each sheet is uniform throughout the length and width.

Job costs are figured on a square foot basis while stainless steel is purchased on a weight basis. When stainless steel is ordered by gauge number the permissible A.I.S.I. thickness variation is plus or minus 10%. If you receive material on the heavy side of the gauge range you are paying a premium for stainless surface area. For example, if you order 18 gauge, you may receive sheets .052" thick, when a thickness of .0475" would suit your purpose. On a standard 18 gauge sheet (36"x 120") each .001" in thickness weighs 1.26 pounds per sheet. In this example, each stainless sheet could weigh as much as 5.67 pounds more than required. You can readily see the advantages of specifying stainless rolled to the light side of the gauge range. MicroRold stainless is rolled to exceptionally close tolerances, as low as 3% average (plus or minus). Regular use of MicroRold provides more stainless area per ton or the equivalent area with lesser weight.

If you are not now a user of MicroRold sheet it will pay you to get the full details. Your steel distributor will gladly tell you the MicroRold story.

Washington Steel

Corporation



WASHINGTON

PENNSYLVANIA

before the sand is fed to the dryer. Other improvements are suggested by the experience obtained with the present set up.

Use Long Conveyors

The firing unit if placed at the entrance end of the dryer would tend to produce cooler sand. It has been observed also that longer travel time on belts between cooler and storage bin would contribute to sand cooling.

Hardfacing:

Brick die life extended by hardfacing.

The life of new brick dies is being extended considerably by application of a hardfacing alloy before use, and worn dies are being given new wearing surfaces by this same method. The brick dies are built up on the wearing edge using Colmonoy No. 6 alloy made by the Wall Colmonoy Corp., Detroit. The material is in rod form and is applied with an oxy-acetylene torch.

Dies so protected at Houston Brick and Tile, Houston, Texas, consistently outlast uncoated dies 6 to 1. After they are worn they can be rebuilt a number of times further extending their service life.

Rebuild Worn Dies

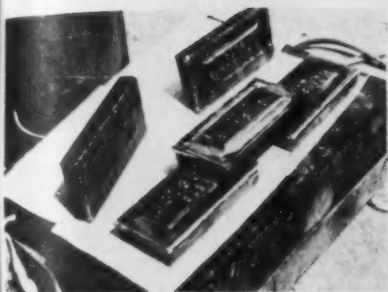
The dies are made from chilled iron with a carbon steel plate riveted to the working side. It is this steel plate that is built up with the No. 6 alloy when it becomes worn.

The alloy used in this application has excellent wear resistance. The coating material is nickel-base alloy containing chromium, boron and nickel and has a hardness of



Apply with rod, torch...

TECHNICAL BRIEFS



Rebuilt brick dies . . .

RC 56-61. It is nonmagnetic, has a specific gravity of 7.80 and melts at 1900°F.

Among its physical properties are high resistance to abrasion, corrosion and galling. The alloy has good impact resistance and excellent red hardness properties.

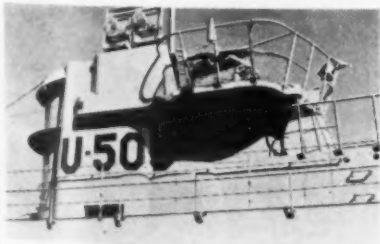
Maintenance:

Anti-rust paint salvages surface of submarine hull.

The only submarine ever captured at sea by the U. S. Navy and the only enemy warship captured at sea by our Navy since 1815, the German Submarine U-505, is now being readied as a permanent display at the Chicago Museum of Science and Industry.

The 1/4 in. hull of the U-505 was badly rusted due to ten years of salt water immersion and weathering. Deep pits and gouges scarred the side of the hull. In many places, the hull was rusted completely through.

A specially processed fish oil containing primer and paint manufactured by the Rust-Oleum Corp., Chicago, Ill., is being used to overcome the rust problem created by the long exposure of the hull to the salt water and atmosphere.



U-boat ready for display . . .

Turn Page



Centrifugally cast Meehanite Metal rams with shoulders grooved for piston rings. These Shenango-produced 18-foot rams can be relied upon to offer outstanding performance.

HOW SHENANGO CASTINGS PAY OFF IN PERFORMANCE!

SHENANGO'S centrifugal castings of Meehanite Metal offer added advantages not found in ordinary castings—advantages that truly pay off in long-lived trouble-free performance.

First, there's pressure-dense grain for a smoother finish and increased tensile strength to better endure stresses and strains. The absence of blowholes and sand inclusions results in fewer rejects and the avoidance of

costly failures and down time.

So, if your plans call for castings—rough, semi- or finished parts, ferrous or nonferrous, remember—Shenango casts the money-saving answer. For complete information regarding Shenango centrifugal castings of Meehanite Metal, write today to:

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Centrifugal Castings Division

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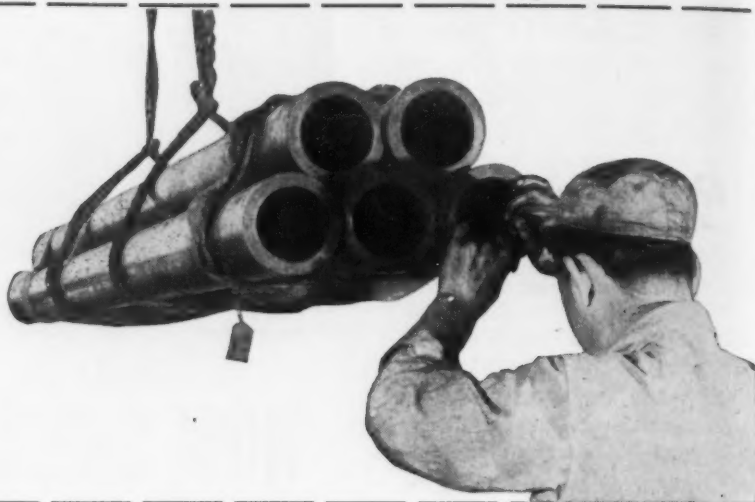
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New Books:

"Fiberglas Reinforced Plastics," by Ralph Sonneborn and others. Covers the resins and glass reinforcements used in reinforced plastics, molding techniques, inspection and testing, properties, and design considerations. Special attention is given to the theory and fundamental concepts of reinforced plastics, and to design from the viewpoint of the structural engineer. Reinhold Publishing Corp., 430 Park Ave., New York 22. \$4.50. 244 p.

"Canadian Trade Index 1954," Canadian Manufacturers' Assn., Inc. Directory of products manufactured in Canada and the firms making them. Also covers changes of names, addresses, products listings, foreign representatives, etc. Canadian Manufacturers' Association, Inc., 67 Yonge St., Toronto 1, Canada. \$7.50. 1127 p.

"Corrosion Problems and Prevention in the Chemical and Petrochemical Industries in the U.S.A." Theory and method are discussed. Protective techniques and anti-corrosive and heat-resisting materials are covered. Conclusions and recommendations are given. O.E.E.C. Mission Publications Office, 2002 P St. N.W., Washington 6, D. C. \$1.50. 129 p.

"Shell Molding and Shell Mold Castings," by T. C. Du Mond. Shell molding, its advantages and limitations, cost, selection factors and design are covered. Also discussed are process, equipment, materials for shells, patterns and applications of shell molding. Reinhold Publishing Corp., 430 Park Ave., New York 22. \$2.00. 128 p.

"Thermal Conductivity of Metals and Alloys at Low Temperatures," by R. L. Powell and W. A. Blanpied. Offers accurate data on the thermal conductivity of construction materials at low temperatures. Includes tables of measured values of thermal conductivity for metals and alloys from room temperature down to 0° K. Government Printing Office, Washington 25, D. C. 50¢.

now we're saving runaway jets!



1



2



3



4

Landing a plane without brakes is no small problem.

Yet it's being done with the Runway Over-run Barrier now being built by Acme for U.S. Air Force continental installations. Earlier models at Far Eastern bases already have saved over 40 planes and their pilots.

Here is another example of putting Acme's unusual skills and facilities to use. No problem is too difficult or unusual for Acme engineers . . . explaining Acme's success with design and engineering work, tooling, special machinery, process and test equipment, precision aluminum castings, and fabrication or machining of complete assemblies.

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1 2 3 4

These sequence photographs show an F-54 jet fighter, simulating a brakeless landing at approximately 120 m.p.h. No. 1: plane approaches Runway Over-run Barrier consisting of nylon webbing and steel cable, affixed to twenty tons of steel chain, and attached to steel stanchions. Next: webbing is engaged, raising cable to landing gear height. Third photo: landing struts pull cable taut, breaking it away from stanchions. No. 4: chain is pulling plane (out of photo) to smooth 200-foot stop.



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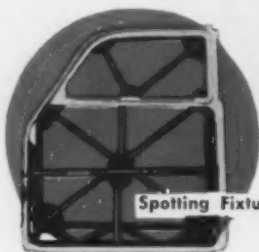
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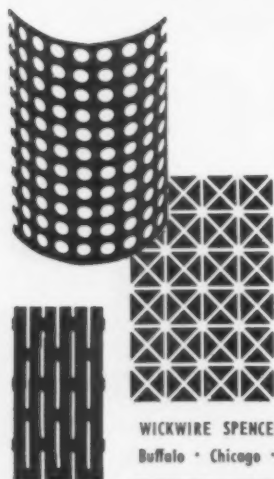
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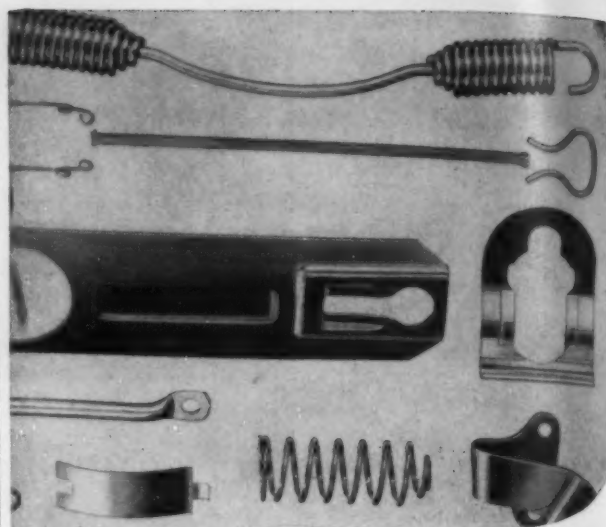
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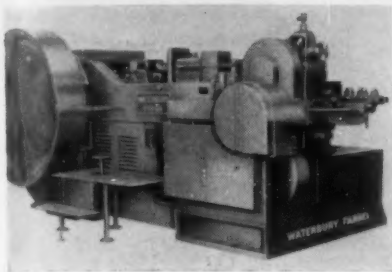
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THE IRON AGE

NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies... for more data use the free postcard on page 141 or 142



Machine heads blanks to 6 in. long at 80 per minute

New 1/2-in. Waterbury solid die double stroke header has design features that are said to step up production speed and blank length capacity without sacrificing quality. It will produce headed blanks up to 6 in. long from an 8-in. maximum wire cut off, at 80 per minute.

Shorter blanks can be headed at 100 per minute. The header is built in both long and short stroke. Punch knockout, timed ejector and knockout relief mechanisms permit heading special shapes. *Waterbury Farrel Foundry & Machine Co.*

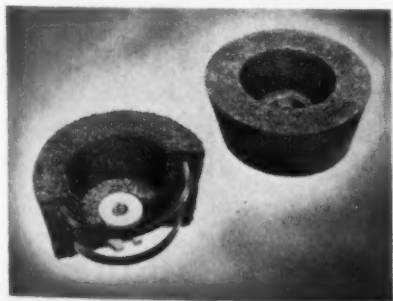
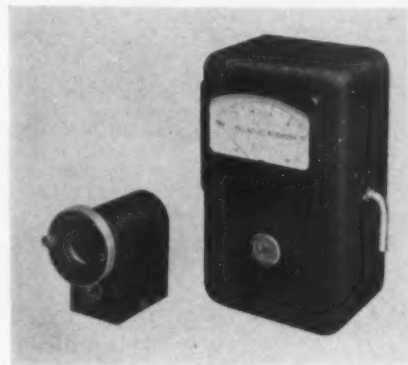
For more data circle No. 33 on postcard, p. 141.

Electronic control of temperature of hot materials

A photoelectric pyrometer for industrial use makes possible the precise monitoring and control of the temperature of hot materials. The control operates from the amount of infra-red radiation emitted by the hot object, and since the radiation increases proportionately with the temperature, a constant indication is given of the heat of the material being scanned.

Through a fast-acting relay, the heat applied to the material can be closely controlled at any point throughout the range of the set. System is suited for measuring temperature of objects that are moving, or are surrounded by induction heating coils, or are difficult to measure. *Photoswitch Div., Electronics Corp. of America.*

For more data circle No. 34 on postcard, p. 141.



Reinforced wheel increases safety factor in grinding

New resinoid grinding wheel for portable grinders has two rings embedded directly in the usable portion of the wheel. These Grind-Away safety rings are said to have greater tensile strength than steel, but at the same time will abrade away during the normal cutting of the wheel without any interference

to the grinding action. The safety rings provide the strength where the grinding is taking place. At present this safety feature has been extended only to straight wheels and type 5, 6, and 11 cups for portable grinders. *Colonial Abrasive Products Co.*

For more data circle No. 35 on postcard, p. 141.

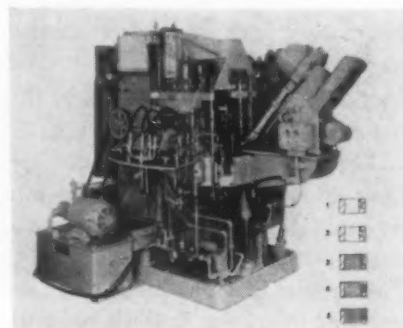
Drills, taps, assemblies, and inspects Nylok locknuts

For volume production of the Nylok nut a standard Bodine Model 48-30 dial type drilling and tapping machine has been tooled to perform automatically the sequence of operations. The machine takes the cold headed nut blanks and completes all necessary machining and assembly operations on the nut in a completely automatic cycle. Elec-

trical inspection devices are incorporated in the machine at various stages of the processing. Tooling is totally interchangeable and machines can be readily changed from one size nut to another. Production rates vary from 1400 to 3000 pieces per 50-min-hr. *Bodine Corp.*

For more data circle No. 36 on postcard, p. 141.

Turn Page



Every Crack Has a Cause!

Inspection with
MAGNAFLUX*
at the *RIGHT* times

- Finds the Cause
- Suggests the Remedy
- Reduces Rejects
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Crack as revealed by Magnaflux in the end-bell casting on an electric motor. Crack is the result of improper handling.

Not *all* cracks are serious. It depends upon the type, size and location. But in the few areas where stress is high, even a tiny crack can be important, because it raises the stress still further.

The *right* time to find cracks is when they *first* occur. This may be anywhere from pilot run to handling for shipping. Wherever it is, sampling inspection with Magnaflux finds and clearly marks the defect to point to the cause.

By finding serious defects early in processing, you can determine *where* they occur and how to correct them — before parts are run in quantity and later rejected. Correction often involves only a minor change in design or feeding procedure, or in cleaning or handling, with each change checked by Magnaflux in pilot runs. This results in a production run with almost no rejection due to cracks. It leads to castings with even stress

flow, that are cheaper to pour, lighter, stronger and better looking.

With **RELIABLE** castings cheap to make, many foundries that use inspection with Magnaflux are now selling castings where formerly more costly parts were used.

Find out now how inspection with Magnaflux can help you produce better castings, at lower cost to a bigger market! Ask to have a Magnaflux Engineer call and give you the facts.

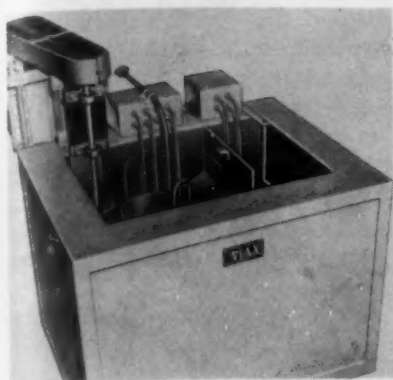
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Cataract quench furnace has high quenching power

Because of new design of a salt bath isothermal quenching furnace, the quenching power of molten salt (400°F and above) equals that or surpasses that of agitated oil (100° to 150°F). With this new quench furnace it is possible to heat treat by the isothermal quenching process, steel products that were considered borderline cases—those that could not be austempered or martempered. Secret

of the quenching power of the furnace is the uniform, high velocity downward flow of salt confined within a special quench header. Cataract quenching increases the cooling rate in the critical range 1300°—1000°F. Steel that can be satisfactorily hardened by oil quenching can be martempered or austempered in a Cataract quench furnace. *Ajax Electric Co.*

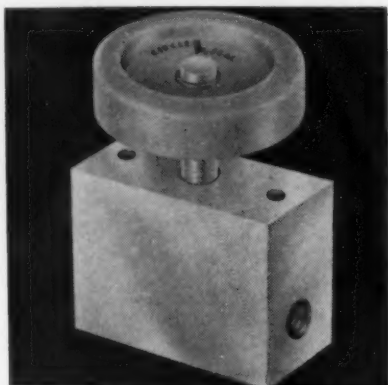
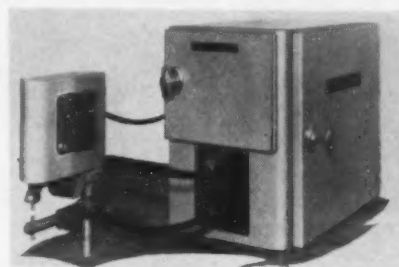
For more data circle No. 37 on postcard, p. 141.

New type control developed for small spot welders

An electronic welder control is for use with manually operated small spot welders operating from single-phase alternating current. Such application requires a 1/2 cycle (or less) precisely timed interval of weld current to be passed while the remainder of the welder sequence

is controlled by other means. Controls and transformer are housed in the one unit for compactness and efficiency. This type bench welder is used for such applications as instruments, vacuum tubes, electronic apparatus. *Taylor-Winfield Corp.*

For more data circle No. 38 on postcard, p. 141.



Valve design offers positive, leak-proof shutoff

Valve design uses a resilient O ring to provide positive, leak-proof shutoff in Circle Seal's 900 Series manual shutoff valves. The O ring is withdrawn completely and automatically from the fluid stream as soon as the valve begins to open and throttling is accomplished by a conical metal plug which varies the orifice area. In principle the 900 series valve is two valves. The shutoff section employing an O ring

is drawn back into the throttling section when the valve is opened, both actions being accomplished in a single motion. No reversal or abrupt change in direction of flow takes place within the valve, assuring very low pressure drop even when pressure and/or flow rate is high. Rated at 0-3000 psi these valves are used in hydraulic or pneumatic service. *James-Pond-Clark.*

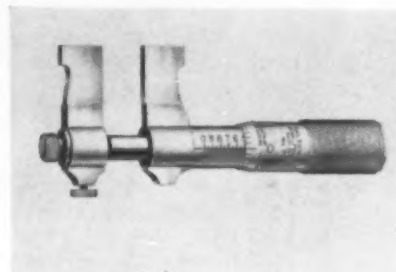
For more data circle No. 39 on postcard, p. 141.

Inside micrometer caliper features 1 to 2 in. range

Precision measuring of hole diameters and linear dimensions between inside surfaces can be accomplished quickly and easily with a new inside micrometer caliper. No. 700 combines convenience and quick-reading features of a micrometer with vernier caliper-style jaws in

a tool that is compact, well balanced and easy to use around precision work. Range is 1.000 to 2.000 in. by thousandths of an inch. No-glare satin chrome finish eliminates glare and eye strain, makes tool easy to read. *L. S. Starrett Co.*

For more data circle No. 40 on postcard, p. 141.



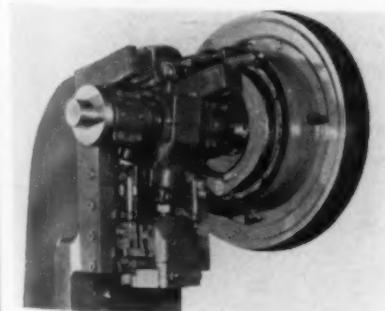
Standardized press application for new and old presses

Users and manufacturers of open back inclinable and straight side presses are offered a standardized press application that features the Fawick Airflex clutch and brake in a completely packaged arrangement. The unit includes new fly wheel mounted on anti-friction bearings, components and electro-

pneumatic control. Seven sizes are adaptable to OBI and straight side presses ranging from 15 to 110 ton capacity. Instructions for installing are furnished with the new clutch and brake, but service facilities are available if required. *Fawick Corp.*

For more data circle No. 41 on postcard, p. 141.

Turn Page



(Advertisement)

If miniaturization is a problem BERYLLIUM COPPER MAY SOLVE IT



THE PROBLEM. Aware of the trend to smaller, lighter products, Edison engineers set out to create the V.P. Voicewriter—a personal dictating machine compact enough for carrying in a brief case, yet sturdy enough to match the performance of larger units. Several of the V.P.'s vital parts pre-

sented a serious problem of material selection. Besides meeting the over-all objective of space saving, these parts would be required to have a variety of special properties to facilitate assembly and to maintain Edison's high standards for service-free performance.



THE SOLUTION. Thanks to high strength, versatile Berylco beryllium copper, these critical components do a big job, take up little room in the production model of the V.P. Berylco provided every

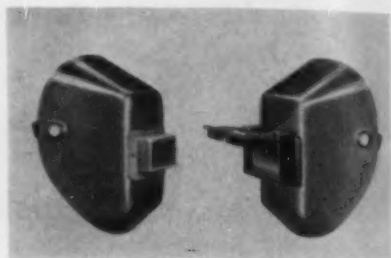
required feature—both space and performance requirements—in more than adequate measure. And the V.P. was easier to assemble because several of the Berylco parts could be highly stressed without damage.

PERFORMANCE PLUS. Edison selected Berylco beryllium copper not for one valuable property, but many. Conductivity, hardness, stress resistance, wear resistance, nonmagnetic qualities, spring qualities, ability to be fixture heat treated without loss of elasticity—every one was important. In all these requirements Berylco delivers performance *plus*. That's why it has enabled manufacturers of such diverse things as bearings, precision switches, controls and machine tools to make smaller, lighter, more efficient products. Berylco can help you, too. For sample material or engineering assistance, write THE BERYLLIUM CORPORATION, Dept. 4-K, Reading 6, Pa.

Tomorrow's products are planned today—with Berylco beryllium copper

Welding helmets

Two helmets in narrow-front style are made in modern fiber-glass plastic. Fixed-front helmet type H-3 has light metal lens holder. Cover glass is replaced from the front by sliding it out without disturbing



other parts. Lift-front helmet type H-4 permits work inspection without raising the entire helmet. Lens holder is of high-impact thermo-setting plastic with hinged door held up or down by coil springs. Headgears are smooth plastic, easy to clean, with snap-on, cork-padded sweatband. *Jackson Products, Inc.*

For more data circle No. 42 on postcard, p. 141.

Surface broach

New vertical hydraulic surface broaching machine with 90-in. stroke and 15-ton work capacity was developed to meet the rugged requirements and precision tolerances encountered in machining jet engine alloys. It also is suitable for other surface broaching applications. The machine can be supplied as a single or dual ram unit. Variable broaching speed ranges from 5 to 30 fpm; return speed 60 fpm. *American Broach & Machine Co.*

For more data circle No. 43 on postcard, p. 141.



NEW EQUIPMENT

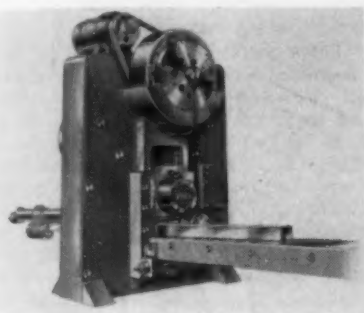
Carbide boring bars

New carbide boring bars have hardened and ground shanks to insure maximum rigidity and accuracy; slash milled design and nickel shim sandwich braze which eliminates tip fracture due to brazing strain. To assure utmost economy, carbide tip overhang is engineered into each boring bar to end the grinding or snagging of steel when resharpener the tool. Complete range of sizes and carbide hardness are available. *Nelco Tool Co., Inc.*

For more data circle No. 44 on postcard, p. 141.

Billet and mill bar shear

Cold cutting of blanks from square and round sections and flat stock for subsequent shaping and machining by drop forging and other methods is possible on the Pels billet and mill bar shear, Model KSGH



630. Use of high quality blades in conjunction with blade rocker arrangement, pressing-up device and feed gap adjustment is said to obtain absolutely clean, perpendicular cuts. The machine will cut square section stock to 5 in. thick; round stock to 5½ in. diam; flats 15 x 1½ in. Working load is 630 tons. *Industrie-Werke Karlsruhe.*

For more data circle No. 45 on postcard, p. 141.

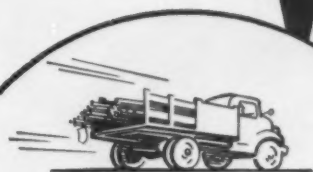
Paste solder

SweTite paste solder for sweat soldering or tinning consists of a blend of 50/50 powdered solder and an active flux. For most applications cleaning is unnecessary. The paste is applied with brush or cloth, the parts fitted together, and heat applied. Flux residue can be removed by wiping the joint with a damp cloth. *Alpha Metals, Inc.*

For more data circle No. 46 on postcard, p. 141.

Turn Page

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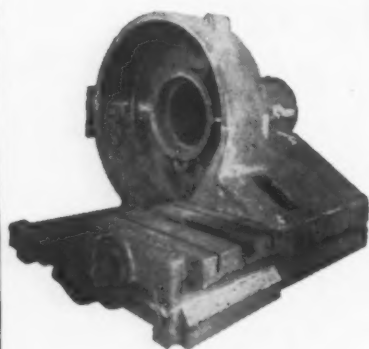
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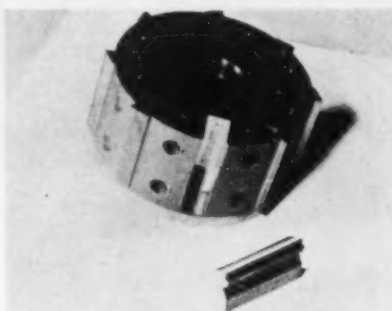
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ROLLS
ROLLING MILL MACHINERY
GREY IRON CASTINGS

NEW EQUIPMENT

Reproduces serrations

A milling cutter combination consists of a specially-designed cutter body and inserted blades that are carbide tipped and form relieved to reproduce serrations in such items as inserted blades of milling cut-



ters, boring bars, counter bores, spot facers and reamers. Carbo-loy grade 78B carbide is used to tip the inserted blades. Cutter body is 3 1/4 in. OD and 1 1/2 in. wide. Its eight inserted blades are mechanically held. Blades can be removed and replaced without indicating or grinding in assembly. *Fenton Carbide Tool Co., Inc.*

For more data circle No. 47 on postcard, p. 141.

Angle comparator

New precision angle comparator has wide applications in machine shop and metalworking departments for comparing parallelism between two surfaces, squareness and angles. Once the instrument is set



up, inspection of finished parts can proceed quickly on a production basis. The comparator operates entirely on optical principles. No pressure of any kind is applied to the piece being inspected. *Perkin-Elmer Corp.*

For more data circle No. 48 on postcard, p. 141.

ONLY 1 1/2 MINUTES to weld joint in 12" pipe fitting

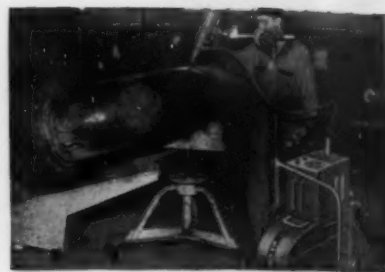


Figure 1. Perfect X-Ray Results on welding flanges and fittings. Welding gun is mounted on inexpensive fixture.

HIGH quality welds are now produced with single pass welds using Manual Lincolnweld. (Figure 1) Welding speeds average 25 inches per minute. No joint preparation is necessary, because high density currents used (up to 600 amp on 3/4" electrodes) permit 100% butt welds on plates up to 3/4" with single pass from each side. The welds pass X-Ray inspection.

Through faster, easier welding, substantial cost savings are realized on construction and maintenance work where the work can be welded in the flat or near flat position. A lightweight welding gun and flexible cable permit free, easy movement for manual operation. (Figure 2) The welding gun can also be mounted on simple, inexpensive fixtures to provide the benefits of automatic welding at low cost.

Manual Lincolnweld is versatile for hardsurfacing of worn parts. Hardsurfacing is done with mild steel electrodes and Lincoln Agglomerated Fluxes in which the alloy is introduced through the flux.



Figure 2. Free, easy movement permits welder to guide welding gun for many types of down-hand operations for maintenance and fabrication work.

HOW MANUAL LINCOLNWELD CUTS YOUR COST

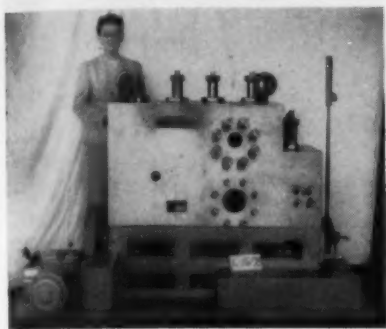
Details in Bulletin 1303, available by writing.

THE LINCOLN ELECTRIC COMPANY
Dept. 1511, Cleveland 17, Ohio
THE WORLD'S LARGEST MANUFACTURER OF
ARC WELDING EQUIPMENT

NEW EQUIPMENT

Hydraulic control valves

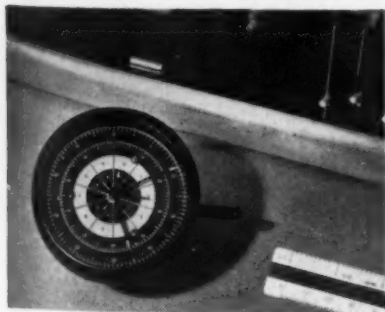
Electrically operated control valves have been developed for use on hydraulic systems up to 6000 psi. The valves are of balanced design, permitting extremely effortless manual operation. Control of the various valves of a system has been centralized in a single console with a means of remote control. To this



end, a motor operator has been incorporated to power the valve cam shaft, a cam limit switch to allow program controlling, and a servo selsyn system for remote operation. Design of the valve blocks permits grouping valve stacks to permit 2, 3, or 4-way functions and throttle cages within the valve permit a measure of speed control with the control valve itself. *Lombard Corp.*
For more data circle No. 49 on postcard, p. 141.

High-speed counter

Based on a low-inertia mechanism, the Rayconter Model 550 cumulative counter is rated for production-control applications at rates up to 3000 per min. Capable of containing counts up to 999,999,



the unit registers with four pointers on four concentric scales reading from the center outward. *Raycon Corp.*

For more data circle No. 50 on postcard, p. 141.

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GOOD PLATING IS VITAL!

MEAKER

PLATING MACHINES

HELP YOU GET IT

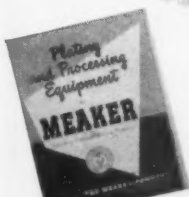
Facts....

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For the occasional job where a special and complicated treatment is needed requiring an intricate handling function, which even a unit as flexible as the Meaker machines cannot provide, our engineers, drawing on more than fifty years' experience in this field, will carefully analyze the problem and design equipment to satisfactorily accomplish the desired results.



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Equally important to the physical structure of a crane is the type of control that governs its movements.

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Large inventory of stock sizes of round punches and dies, also rivet sets available for immediate shipment. Square, rectangular, oblong and elliptical shapes made to order.

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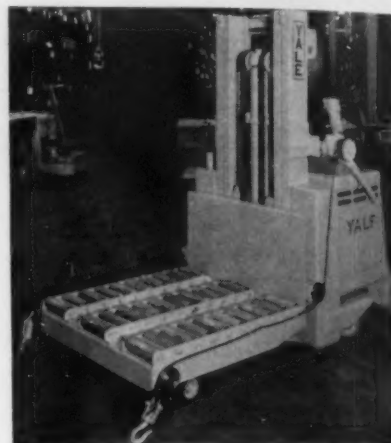
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Die handling truck

Rapid, efficient handling of dies is made possible by this Worksaver 4000-lb capacity die handling truck. Platform is 36 x 36 in. with triple rows of rollers 2 1/4 in. diam. A Pul-Lift type winch operating twin hooks pulls dies off or on roller



platform. Forward end of frame is supported by two stabilizer caster wheels and is articulated so that the drive wheel will maintain contact with the floor regardless of floor variations. Telescopic lift on truck is 93 1/4 in. maximum. Truck has two speeds forward, two reverse and features time delay between each speed. **Yale & Towne Mfg. Co.**

For more data circle No. 51 on postcard, p. 141.

Mold release liquid

New super mold release liquid is reputed to be equally effective in every type of plastics molding. Known as Vin-Rock Super XX, the product is suitable for both injection and compression molding. An ingredient of the product is Vinium, a combination of chemicals which dries almost instantly to a hard, smooth glossy finish and eliminates affinity of plastic for the mold. **Vin-Rock, Inc.**

For more data circle No. 52 on postcard, p. 141.

Selenium rectifier

New high temperature rectifier will operate continuously in temperatures up to 212°F (100°C) at the same voltage and current loads as at room temperatures. The rectifiers are available in all standard cell sizes and circuit arrangements. **Fansteel Metallurgical Corp.**

For more data circle No. 53 on postcard, p. 141.

NEW EQUIPMENT

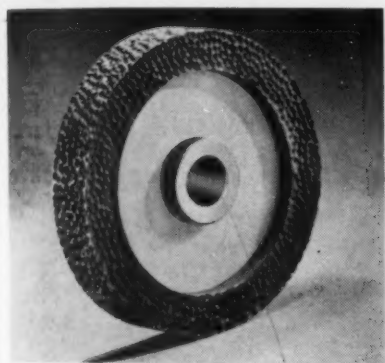
Iron powder electrode

A perfected iron powder electrode is virtually self-cleaning. Named the SW-44, the new electrode enables the user to deposit more E-6012 type weld metal, as well as almost eliminating the job of cleaning. There's good washup with no undercut, and bead appearance is flawlessly smooth with fine ripples. Re-striking is easy, even with a completely cooled rod. *A. O. Smith Corp.*

For more data circle No. 54 on postcard, p. 141.

Cutting wheels

Cutting wheels for nonferrous metals, made of high-grade steel, properly tempered, and with thousands of small pits machined in the surface are said to give the same



results as grinding or emery wheels with no clogging. They cut fast with no load up and are reversible which gives double life. Reconditioning costs little. Wheels are made in all standard sizes and arbors, and for fine or coarse cutting. *Schmidgall Mfg. Co.*

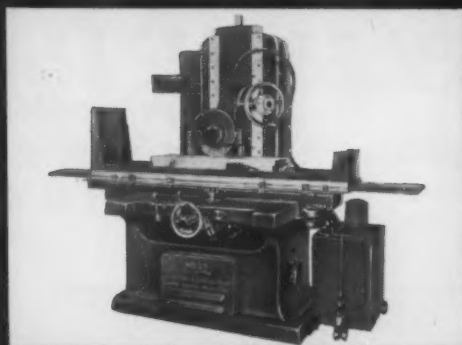
For more data circle No. 55 on postcard, p. 141.

Aluminum protection

Proseal No. 16, a new chromate conversion protective coating for aluminum and aluminum alloys is said to effectively inhibit corrosive action between paint and aluminum. The protective film meets requirements specified in MIL-C-5541 for military aircraft applications and is designed for use on any application where extruded, forged, wrought or cast aluminum and its alloys are used. *Promat Div., Poor & Co.*

For more data circle No. 56 on postcard, p. 141.

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Here is extra value, extra accuracy, extra high-speed performance. Every Grand Rapids Hydraulic Feed Surface Grinder has a one-piece column and base for vibrationless rigidity and permanent alignment between cross travel ways and upright headways. Both longitudinal table travel and cross feed are hydraulically operated. On the larger machines, the wheel head is powered for rapid vertical travel. *The model 55 has longitudinal table speed of 125 fpm.*

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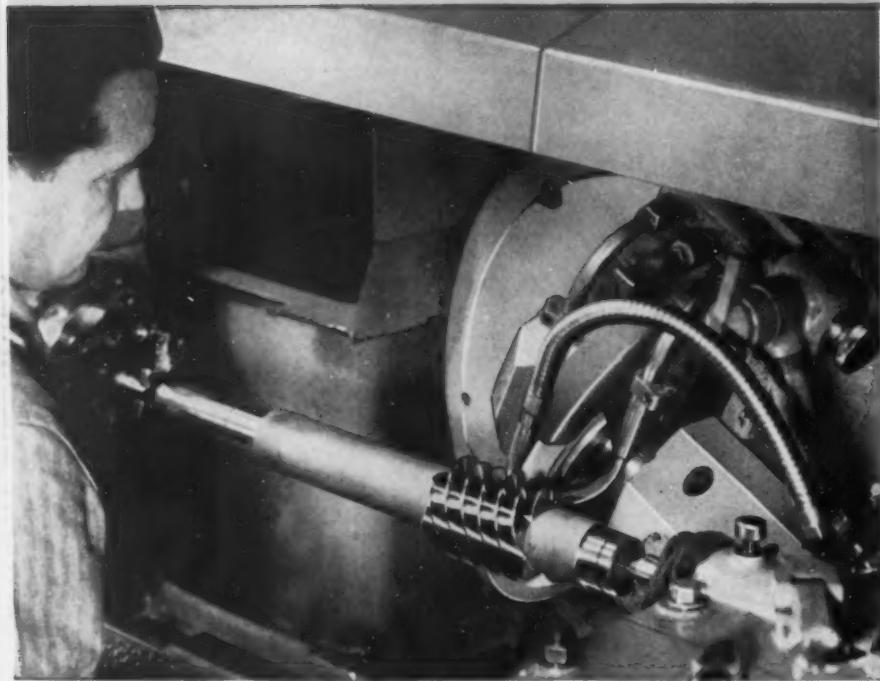
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Grinding 5-Start Worm with 4" Lead

STANDARD STYLE 36 EX-CELL-O Precision THREAD GRINDER



In the photograph at the left the operator is grinding a worm shaft for use in a special machine. The part is about 22" long and the worm is 4½" long, 3.430" O.D., has 5 starts, a pitch of .800", a lead of 4" and a tooth depth of .5454". The worm was ground in two operations on a standard Style 36 Thread Grinder. It was rough ground from the solid, hardened, then finish ground.

For complete information and specifications on the Style 36 and other Ex-Cell-O Thread Grinders contact your local representative or write today to Ex-Cell-O.



A COMPLETE LINE OF PRECISION THREAD GRINDERS



STYLE 50
Precision Thread Grinder—a versatile machine for external work, also available with internal attachment.

STYLE 33
Precision Thread Grinder—a high production machine for external work.

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Precision Thread Grinder—a high production machine for internal threads.

STYLE 36
Precision Thread Grinder—a versatile machine for extremely long external threads, available with internal attachment.

EX-CELL-O CORPORATION • Detroit 32, Michigan

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The Iron Age SUMMARY . . .

Steel production surges up to 78.0 pct of rated capacity . . . Output has gained more than 26 pct in less than 3 months . . . Sheets tightest.

Production . . . Upsurging steel production threatens to knock all predictions into the trash can. Having spurted more than 26 pct in less than 3 months, the climbing steel output has already relegated many forecasts to the ash heap. And there is still no sign that it has reached its peak.

Steelmaking operations this week are scheduled at 78.0 pct of rated capacity, 2 points higher than last week's estimate. This week's rate is the highest since mid-December of 1953. The steel ingot production index this week is estimated at 115.5 (1947-49 = 100).

Detroit has the highest district operating rate, 100 pct. But mills in the Buffalo district are operating at 95.5 pct; in Wheeling district at 94 pct, and in St. Louis at 87 pct. Other district rates include: Cleveland and South Ohio River, 85 pct; Pittsburgh and Youngstown, 74; Philadelphia, 68.5; Birmingham, 64; and East, 46.

New Orders . . . The tightening sheet market is getting an extra turn from anxious consumers who are worried about future supplies. Anxiety of customers is reflected in a willingness to place first quarter orders—in some cases before actual requirements have been determined. If initial first quarter orders are a fair sample, cold-rolled

sheets will be in very tight supply during January and February, and perhaps longer.

At some mills incoming order volume has been so heavy that clerks have become buried under a mountain of paper. This has caused mills to slow up in accepting orders, so that their old customers will have a chance to get on the books.

Bulk of the advance ordering seems to be coming from small and middle-sized users who are afraid they will be crowded out by big consumers. Large buyers are still confident.

Another factor in the trend to forward buying is the desire of some customers to be on the order books of nearby mill suppliers. Midwestern consumers who are placing first quarter orders could get delivery from eastern mills in about half the time they have to wait for delivery from nearby mills.

Distribution . . . It's not hard to tell what's putting the extra zip into the market. The auto industry is rapidly gearing up to record year-end production levels. If auto output can be held to schedules, the worry over sheet suppliers will have been well founded. The auto industry usually consumes about half of all cold-rolled sheets produced.

Steel Output, Operating Rates

| Production | This Week† | Last Week | Month Ago | Year Ago |
|-------------------------|------------|-----------|-----------|----------|
| (Net tons, 000 omitted) | 1,842 | 1,822 | 1,735 | 2,081 |
| Ingot Index | | | | |
| (1947-49=100) | 115.5 | 113.4 | 108.0 | 129.5 |
| Operating Rates | | | | |
| Chicago | 81.5 | 79.0 | 76.0 | 97.0 |
| Pittsburgh | 74.0 | 74.0 | 71.0 | 93.0 |
| Philadelphia | 68.5 | 68.5 | 62.0 | 94.0 |
| Valley | 74.0 | 71.0 | 68.0 | 92.0 |
| West | 79.0 | 83.0* | 84.0 | 91.0 |
| Detroit | 100.0 | 97.0 | 93.0 | 94.0 |
| Buffalo | 95.5 | 87.5 | 70.5 | 106.5 |
| Cleveland | 85.0 | 81.0* | 75.0 | 102.0 |
| Birmingham | 64.0 | 64.5 | 74.0 | 96.5 |
| S. Ohio River | 85.0 | 87.0 | 82.0 | 81.0 |
| Wheeling | 94.0 | 81.0* | 91.0 | 102.0 |
| St. Louis | 87.0 | 91.0 | 76.5 | 89.0 |
| East | 46.0 | 45.0* | 49.0 | 103.0 |
| Aggregate | 78.0 | 76.5 | 72.5 | 92.5 |

* Revised. † Tentative

Prices At A Glance

(cents per lb unless otherwise noted)

| | This Week | Week Ago | Month Ago | Year Ago |
|------------------------------|-----------|----------|-----------|----------|
| Composite prices | | | | |
| Finished Steel, base | 4.798 | 4.798 | 4.798 | 4.634 |
| Pig Iron (gross ton) | \$56.59 | \$56.59 | \$56.59 | \$56.59 |
| Scrap, No. 1 hvy (gross ton) | \$34.00 | \$34.00 | \$33.00 | \$35.33 |
| Nonferrous | | | | |
| Aluminum, ingot | 22.20 | 22.20 | 22.20 | 21.50 |
| Copper, electrolytic | 30.00 | 30.00 | 30.00 | 29.75 |
| Lead, St. Louis | 14.80 | 14.80 | 14.80 | 13.30 |
| Magnesium, ingot | 27.75 | 27.75 | 27.75 | 27.00 |
| Nickel, electrolytic | 63.08 | 63.08 | 63.08 | 63.08 |
| Tin, Straits, N. Y. | 91.25 | 92.25 | 93.375 | 81.75 |
| Zinc, E. St. Louis | 11.50 | 11.50 | 11.50 | 10.00 |

May Allocate Cold Sheets

Order scramble moves into first quarter . . . Many mills have closed their books on cold-rolled sheets until old customers get orders in . . . Bars, galvanized improve.

◆ THE BOOMING cold-rolled sheet market is approaching the point where the mills will be forced to install a system of allocations to insure an equitable distribution of available material.

One mill has already worked out such a program, expects to put it into effect if cold-rolled sheet market grows any tighter. Other producers have shut the door against first-quarter commitments until old line customers can get orders on the books. In virtually all areas, fourth-quarter business is solid either on the basis of orders booked or orders in process. Incoming volume has been so heavy that order clerks are buried under a mountain of paper.

Producers say automotive customers are talking about record production during December and eating up steel as fast as it is delivered. Automotive inventories are said to be at a minimum. But thus far the car builders are not committing themselves for first quarter delivery despite frantic pleas of producers for an inkling on requirements for that period.

Appliance makers also are pressing for quick sheet deliveries in volume.

The picture in other products: Hot-rolled sheets, improved and in fair supply; oil country goods more competitive and backlogs dropping as consumers cut inventories; galvanized sheets continue strong; merchant pipe in good demand; hot-rolled bars improved but disappointing; structurals—light sections good, heavies standing still; wire, merchant and construction off, manufacturers good, specialties improving slightly; plates, easy; alloy bar demand improving; warehouse business is generally spotty.

SHEETS AND STRIP . . . Cold-rolled sheet market continues to tighten. Fourth-quarter business virtually assured and some mills are booking for first quarter. Automotive consumers frantic for quick deliveries. In Chicago, deliveries are extended an estimated 7 weeks. Contrariwise, Detroit has turned up an auto producer who claims he is able to place orders for delivery in 45 days. But reports from all producing centers are too unanimous to conclude that the market is anything but tight. Hot-rolled sheets and strip can be had on relatively short delivery. Galvanized continues strong, with farm dropoff countered by increased building applications. Stainless demand improving with pickup in automotive production. Tinplate is in a seasonal decline. Weirton Steel Co. has begun production of a four-story building to house a new continuous cleaning and annealing line, plus other facilities and warehouse space at its tin mill. Construction will be completed in mid-1955. Cleaning and annealing line will handle 60,000 lb. coils of cold-rolled strip up to 45-in. wide in tinplate gages, will operate at 2000 fpm. Capacity will be 60 tons per hr. Coated strip specialty orders are in late fourth quarter with increased demand from automotive and appliances.

BARS . . . Market is improving but response not up to expectations. Apparently both consumer and warehouse inventories are still heavy. Story is

Purchasing Agent's Checklist

SALES: U. S. Steel launches appliance promotion campaign . . . p. 75

SCRAP: May link export quota with steel production rate p. 76

TANKS: One producer sees '55 business better than current year . p. 80

STEEL: Warehouse buying catches up with sales rate p. 83

the same from all centers—improved but not heavily. Automotive demand has improved the alloy situation with deliveries gradually extending compared with virtually spot delivery little more than a month ago.

PLATE AND STRUCTURALS . . . Plate demand continues to lag. Encouraging note from West Coast is increase in number of jobs open for bidding, several of them calling for good tonnages in piping and tankage. The East, Chicago and Pittsburgh report little or no improvement in demand. Decline in linepipe buying is offsetting increased warehouse purchases in Southwest. Structurals are holding up well in the East, but still slow-moving on West Coast. Chicago finds the market good for light sections, stationary for heavy structurals. This market expected to move along at level pace.

PIPE AND TUBING . . . Oil country goods still firm but more competitive. Backlogs of some producers dropped substantially for December. Consumers are cutting inventories now that more capacity has been brought into picture. Demand expected to rise again in first quarter. Merchant pipe holding up as construction rate continues high.

WIRE . . . Merchant wire off seasonally. Manufacturers wire still gaining strength. Wire specialties also moving up. Construction wire off in some centers, picking up in Chicago. Furniture, automotive, and cold-heading are spurring manufacturers wire demand. Nails are holding firm.

WAREHOUSE . . . The picture is spotty. Pittsburgh distributors say they have not felt the improvement noted in other districts. For one thing they are still plagued by availability of sheets—seconds, rejects, and menders—at below mill prices. Demand for structurals, plates, and bars, is consistent but not overwhelming. In Chicago, volume continues to move up slightly, including alloy strip and standard strip; cold-finished bars improving a little. In Detroit, sheets are strengthening as consumers find mill deliveries are more extended. West Coast change in quantity prices has not materialized, and warehousemen feel it probably won't. In Cleveland, the overall picture is fair and sheets are in short supply; area warehouses are meeting delivered price schedule started by a chain distributor but some are finding they can't quite match it.

Comparison of Prices

(Effective Nov. 9, 1954)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

| | Nov. 9 1954 | Nov. 2 1954 | Oct. 12 1954 | Nov. 10 1953 |
|--|----------------|----------------|-----------------|-----------------|
| Flat-Rolled Steel: (per pound) | | | | |
| Hot-rolled sheets | 4.05¢ | 4.05¢ | 4.05¢ | 3.925¢ |
| Cold-rolled sheets | 4.95 | 4.95 | 4.95 | 4.775 |
| Galvanized sheets (10 ga.) | 5.45 | 5.45 | 5.45 | 5.275 |
| Hot-rolled strip | 4.05 | 4.05 | 4.05 | 3.925 |
| Cold-rolled strip | 5.82 | 5.82 | 5.82 | 5.575 |
| Plate | 4.225 | 4.225 | 4.225 | 4.10 |
| Plates wrought iron | 9.30 | 9.30 | 9.30 | 9.30 |
| Stain's C-R strip (No. 302) | 41.50 | 41.50 | 41.50 | 41.50 |
| Tin and Ternplate: (per base box) | | | | |
| Tinplate (1.50 lb.) cokes | \$9.05 | \$9.05 | \$9.05 | \$8.95 |
| Tinplate, electro (0.50 lb.) | 7.75 | 7.75 | 7.75 | 7.65 |
| Special coated mfg. ternes | 7.85 | 7.85 | 7.85 | 7.75 |
| Bars and Shapes: (per pound) | | | | |
| Merchant bars | 4.30¢ | 4.30¢ | 4.30¢ | 4.15¢ |
| Cold-finished bars | 5.40 | 5.40 | 5.40 | 5.20 |
| Alloy bars | 5.075 | 5.075 | 5.075 | 4.875 |
| Structural shapes | 4.25 | 4.25 | 4.25 | 4.10 |
| Stainless bars (No. 302) | 35.50 | 35.50 | 35.50 | 35.50 |
| Wrought iron bars | 10.40 | 10.40 | 10.40 | 10.40 |
| Wire: (per pound) | | | | |
| Bright wire | 5.75¢ | 5.75¢ | 5.75¢ | 5.525¢ |
| Rails: (per 100 lb.) | | | | |
| Heavy rails | \$4.45 | \$4.45 | \$4.45 | \$4.325 |
| Light rails | 5.35 | 5.35 | 5.35 | 5.20 |
| Semifinished Steel: (per net ton) | | | | |
| Re-rolling billets | \$64.00 | \$64.00 | \$64.00 | \$62.00 |
| Slabs, re-rolling | 64.00 | 64.00 | 64.00 | 62.00 |
| Forging billets | 78.00 | 78.00 | 78.00 | 75.50 |
| Alloy blooms, billets, slabs | 86.00 | 86.00 | 86.00 | 82.00 |
| Wire Rod and Skelp: (per pound) | | | | |
| Wire rods | 4.675¢ | 4.675¢ | 4.675¢ | 4.525¢ |
| Skelp | 3.90 | 3.90 | 3.90 | 3.75 |
| Finished Steel Composite: (per pound) | | | | |
| Base price | 4.798¢ | 4.798¢ | 4.798¢ | 4.634¢ |

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

| | Nov. 9 1954 | Nov. 2 1954 | Oct. 12 1954 | Nov. 10 1953 |
|---|----------------|----------------|-----------------|-----------------|
| Pig Iron: (per gross ton) | | | | |
| Foundry, del'd Phila. | \$61.19 | \$61.19 | \$61.19 | \$61.19 |
| Foundry, Valley | 56.50 | 56.50 | 56.50 | 56.50 |
| Foundry, Southern, Cin'ti | 60.43 | 60.43 | 60.43 | 60.43 |
| Foundry, Birmingham | 52.88 | 52.88 | 52.88 | 52.88 |
| Foundry, Chicago | 56.50 | 56.50 | 56.50 | 56.50 |
| Basic del'd Philadelphia | 60.27 | 60.27 | 60.27 | 60.27 |
| Basic, Valley furnace | 56.00 | 56.00 | 56.00 | 56.00 |
| Mallenble, Chicago | 56.50 | 56.50 | 56.50 | 56.50 |
| Mallenble, Valley | 56.50 | 56.50 | 56.50 | 56.50 |
| Ferromanganese, cents per lb. | 9.50¢ | 9.50¢ | 9.50¢ | 10.00¢ |
| ‡ 74-76 pct Mn base. | | | | |
| Pig Iron Composite: (per gross ton) | | | | |
| Pig iron | \$56.50 | \$56.50 | \$56.50 | \$56.50 |
| Scrap: (per gross ton) | | | | |
| No. 1 steel, Pittsburgh | \$35.50 | \$35.50 | \$34.50 | \$37.50 |
| No. 1 steel, Phila. area | 33.00 | 33.00 | 30.00 | 34.50 |
| No. 1 steel, Chicago | 33.50 | 33.50 | 34.50 | 34.00 |
| No. 1 bundles, Detroit | 26.50 | 26.50 | 26.50 | 29.50 |
| Low phos., Youngstown | 35.50 | 35.50 | 35.50 | 40.50 |
| No. 1 mach'y cast, Pittsburgh | 42.50 | 42.50 | 42.50 | 45.50 |
| No. 1 mach'y cast, Philadel'a. | 42.50 | 42.50 | 41.00 | 42.00 |
| No. 1 mach'y cast, Chicago | 42.50 | 43.50 | 43.50 | 39.00 |
| Steel Scrap Composite: (per gross ton) | | | | |
| No. 1 heavy melting scrap | \$34.00 | \$34.00 | \$33.00 | \$35.33 |
| Coke, Connellsville: (per net ton at oven) | | | | |
| Furnace coke, prompt | \$14.38 | \$14.38 | \$14.38 | \$14.75 |
| Foundry coke, prompt | 16.75 | 16.75 | 16.75 | 16.75 |
| Nonferrous Metals: (cents per pound to large buyers) | | | | |
| Copper, electrolytic, Conn. | 30.00 | 30.00 | 30.00 | 29.75† |
| Copper, Lake, Conn. | 30.00 | 30.00 | 30.00 | 30.125 |
| Tin, Straits, New York | 91.25† | 92.25 | 93.375 | 81.75 |
| Zinc, East St. Louis | 11.50 | 11.50 | 11.50 | 10.00 |
| Lead, St. Louis | 14.80 | 14.80 | 14.80 | 13.30 |
| Aluminum, virgin ingot | 22.20 | 22.20 | 22.20 | 21.50 |
| Nickel, electrolytic | 63.08 | 63.08 | 63.08 | 63.08 |
| Magnesium, ingot | 27.75 | 27.75 | 27.75 | 27.00 |
| Antimony, Laredo, Tex. | 28.50 | 28.50 | 28.50 | 34.50 |
| † Tentative. ‡ Average. * Revised. | | | | |

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

STAINLESS STEEL

← To identify producers, see Key on P. 181 →

Base price cents per lb. f.o.b. mill

| Producing Point | Basic | Fdry. | Mall | Bess. | Low Phos. |
|-----------------|-------|-------|-------|-------|-----------|
| Bethlehem B3 | 58.00 | 58.50 | 59.00 | 59.50 | |
| Birmingham R3 | 52.38 | 52.88 | | | |
| Birmingham W9 | 52.38 | 52.88 | | | |
| Birmingham U4 | 52.38 | 52.88 | 56.50 | | |
| Buffalo R3 | 56.00 | 56.50 | 57.00 | | |
| Buffalo I11 | 56.00 | 56.50 | 57.00 | | |
| Buffalo W6 | 56.00 | 56.50 | 57.00 | | |
| Chicago I4 | 56.00 | 56.50 | 56.50 | 57.00 | |
| Cleveland A5 | 56.00 | 56.50 | 56.50 | 57.00 | 61.00 |
| Cleveland R3 | 56.00 | 56.50 | 56.50 | | |
| Dangerfield L3 | 52.50 | 52.50 | 52.50 | | |
| Duluth I4 | 56.00 | 56.50 | 56.50 | 57.00 | |
| Erie I4 | 56.00 | 56.50 | 56.50 | 57.00 | |
| Everett M6 | | 61.00 | 61.50 | | |
| Fontana K1 | 62.00 | 62.50 | | | |
| Genova, Utah C7 | 56.00 | 56.50 | | | |
| Granite City G2 | 57.90 | 58.40 | 58.90 | | |
| Hubbard Y1 | | | 56.50 | | |
| Minnequa C6 | 58.00 | 59.00 | 59.00 | | |
| Monessen P6 | 56.00 | | | | |
| Neville Isl. P4 | 56.00 | 56.50 | 56.50 | | |
| Pittsburgh U1 | 56.00 | | | 57.00 | |
| Sharpsville S3 | 56.00 | 56.50 | 56.50 | 57.00 | |
| Sa. Chicago R3 | 56.00 | | 56.50 | | |
| Swanton B3 | 58.00 | 58.50 | 59.00 | 59.50 | 64.00 |
| Swedeland A2 | 58.00 | 58.50 | 59.00 | 59.50 | |
| Tahleah I4 | 56.00 | 56.50 | 56.50 | 57.00 | |
| Troy, N. Y. R3 | 58.00 | 58.50 | 59.00 | 59.50 | 64.00 |
| Youngstown Y1 | | | 56.50 | 57.00 | |
| N. Tonawanda T1 | | | 56.50 | 57.00 | |

| Product | 301 | 302 | 303 | 304 | 316 | 321 | 347 | 410 | 416 | 430 |
|--------------------------------|-------|-------|-------|-------|-------------|-------------|-------|-------|-------|-------|
| Ingot, re-rolling | 16.25 | 17.25 | 18.75 | 18.25 | 28.00 | 22.75 | 24.50 | 14.00 | | 14.25 |
| Slabs, billets, re-rolling | 20.50 | 22.75 | 24.75 | 23.75 | 36.25 | 29.50 | 32.25 | 18.25 | | 18.50 |
| Forg. discs, die blocks, rings | 38.50 | 38.50 | 41.50 | 40.50 | 60.00 | 45.50 | 50.75 | 31.00 | 31.75 | 31.75 |
| Billets, forging | 29.50 | 29.75 | 32.25 | 31.00 | 46.50 | 35.25 | 39.50 | 24.00 | 24.50 | 24.50 |
| Bars, wires, structurals | 35.25 | 35.50 | 38.25 | 37.25 | 55.50 | 42.00 | 46.75 | 28.75 | 29.25 | 29.25 |
| Plates | 37.25 | 37.50 | 39.75 | 39.75 | 58.75 | 45.75 | 51.25 | 30.00 | 30.50 | 30.50 |
| Sheets | 41.25 | 41.50 | 48.75 | 43.75 | 62.75 | 50.50 | 59.25 | 34.25 | 41.25 | 34.75 |
| Strip, hot-rolled | 29.75 | 32.00 | 36.75 | 34.25 | 53.25 | 41.00 | 46.50 | 26.25 | | 27.00 |
| Strip, cold-rolled | 38.25 | 41.50 | 45.50 | 43.75 | 62.75-63.00 | 50.50-50.75 | 59.25 | 34.25 | 41.25 | 34.75 |

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., C11; Brackenridge, Pa., A3; Butler, Pa., A7; McKeesport, Pa., U1; Washington, Pa., W2, J2; Baltimore, El; Middletown, O., A7; Massillon, O., R3; Gary, U1; Bridgeville, Pa., U2; New Castle, Ind., I2; Ft. Wayne, J4.

*Strip: Midland, Pa., C11; Cleveland, A5; Carnegie, Pa., S9; McKeesport, Pa., F1; Reading, Pa., C2; Washington, Pa., W2; W. Leeburg, Pa., A3; Bridgeville, Pa., U2; Detroit, M2; Canton-Massillon, O., R3; Middletown, O., A7; Harrison, N. J., D3; Youngstown, C5; Sharon, Pa., S1; Butler, Pa., A7; Wallingford, Conn., U3 (.25¢ per lb higher) W1 (.25¢ per lb higher); New Bedford, Mass., R6.

Bar: Baltimore, A7; Duquesne, Pa., U1; Munhall, Pa., U1; Reading, Pa., C2; Titusville, Pa., U2; Washington, Pa., J2; McKeesport, Pa., U1, F1; Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillon, O., R3; Chicago, U1; Syracuse, N. Y., C11; Watervliet, N. Y., A3; Waukegan, A5; Canton, O., T5; Ft. Wayne, I4.

Wire: Waukegan, A5; Massillon, O., R3; McKeesport, Pa., F1; Ft. Wayne, J4; Harrison, N. J., D3; Baltimore, A7; Dunkirk, A3; Monessen, P1; Syracuse, C11; Bridgeville, U2.

Structurals: Baltimore, A7; Massillon, O., R3; Chicago, Ill., J4; Watervliet, N. Y., A3; Syracuse, C11

Plates: Brackenridge, Pa., A3; Chicago, U1; Munhall, Pa., U1; Midland, Pa., C11; New Castle, Ind., I2; Middletown, A7; Washington, Pa., J2; Cleveland, Massillon, R3; Conesville, Pa., C15.

Forged discs, die blocks, rings: Pittsburgh, C11; Syracuse, C11; Ferndale, Mich., A3; Washington, Pa., J2.

Forging billets: Midland, Pa., C11; Baltimore, A7; Washington, Pa., J2; McKeesport, F1; Massillon, Canton, O., R3; Watervliet, A3; Pittsburgh, Chicago, U1; Syracuse, C11.

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.50 pct manganese over 1 pct, \$2 per ton for 0.5 to 0.75 pct nickel, \$1 for each additional 0.25 pct nickel. Subtract 35¢ per ton for phosphorus content 0.70 and over.

Silvery Iron: Buffalo, H1, \$68.25; Jackson, J1, G1 \$67.00. Add \$1.50 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. Add \$1 per ton for 0.75 pct or more phosphorus. Add 75¢ for each 0.50 pct manganese over 1.0 pct. Bessemer ferro-silicon prices are \$1 over comparable silvery iron.

Buying Mild in Quiet Market

Mill purchases light in most areas . . . Some prices soften, but No. 1 grades generally are firm . . . Composite price holds fast at \$34 . . . Trade discounts bearish rumors

◆ **THE SCRAP MARKET** was generally quiet this week, with mill orders definitely on the light side. Bearish talk was heard in some areas, particularly Pittsburgh and Chicago, but the trade discounted it in most cases.

Some secondary grades softened in price, but No. 1 grades held fast in all areas save Buffalo. The \$1-per-ton dip there came as a frank surprise to the trade, who had expected the 8-point rise in the area's ingot rate to be reflected in higher scrap prices. **THE IRON AGE** Heavy Melting Steel Scrap Composite Price remained unchanged from last week's \$34 per gross ton. Cleveland No. 1 steel price rose \$1 on the basis of a sale.

For latest developments in scrap export hearings in Washington, see p. 76 this issue—Ed.

Despite some softening in the market, dealers and brokers are generally optimistic, point out that volume and price increases this fall have retained a fairly close relationship to ingot output.

Pittsburgh . . . Lack of demand seems to be generating a lot of bearish talk in the district this week. An independent mill is reported to have bought small lots of No. 2 steel and No. 2 bundles at \$29 and \$27, respectively. But this is being classed as "distress," and leading brokers say they are not interested. Counteracting the pessimistic tone, however, is the strength of the finished steel market and the likelihood of its maintaining a good level for balance of the year. Meanwhile, prices are unchanged.

Chicago . . . Repeated efforts to move the market down locally, particularly in the absence of strong mill buying, began finally to pay off last

week as a turnings purchase was closed at a \$1 drop in price and as electric furnace slipped somewhat. Weakening was confined largely to electric furnace and blast furnace grades, with melting grades holding strongly despite low volume. A new No. 2 heavy melting sale dropped this grade \$1, but others held and even No. 2 bundles were holding a fair asking price. Cast continues relatively weak. Broker buying prices reported late last week at a \$1-\$2 drop in steel-making grades were not confirmed in sales at press time.

Philadelphia . . . Big question mark of the dock strike here is: "When will it end?" So far it has just about shut off the export market and local mills are taking it easy to see what develops. Dealers have cut back their buying prices but, by and large, prices remain unchanged with the market in a definite pause.

New York . . . Market tone is very firm here. Re-entry of smaller mills in adjacent consuming area has had a tonic effect. Volume so far has been moderate, and prices were holding at last week's levels at press time. But brokers predict a price rise if mill buying volume picks up to any degree. Exports continue an important factor.

Detroit . . . Continued purchasing of No. 1 bundles at quoted prices kept the Detroit market in balance this week despite fluctuations in other grades. Orders of high quality low phos boosted its price \$2, but this was counterbalanced in overall market strength by a drop in turnings and continued lethargy in No. 2 grades. A rising local operating rate has maintained level prices with little of the strength coming from out of district.

Cleveland . . . Price on No. 1 heavy melting went up \$1 to \$34 top on basis of sale to one producer. Overall market here, however, was weaker than in the Valley. Brokers were canvassing dealers for No. 1 and some foundry

dry grades. In the Valley two mills bought fair tonnage last week. Special grade industrial heavy melting directly from plant went for \$37.50. Open market in the Valley remained strong at \$36 top for No. 1 heavy melting. Foundry grades registered some losses of \$1 a ton.

Birmingham . . . Market as a whole is very sluggish on practically all grades, with even specialty items moving very poorly. Major open-hearth consumers entered the market for November on the same price basis as last month, disappointing dealers who were expecting an increase. Some brokers who also had expected increases had made commitments at from \$1 to \$1.50 above that offered by mills. Foundries were buying cast for November at October prices.

St. Louis . . . Market is steady with prices unchanged. There may be some changes next week when mills place orders for December shipment. Shipments have been ample to fill orders promptly. Stove plate is strong with demand coming from district and Birmingham consumers.

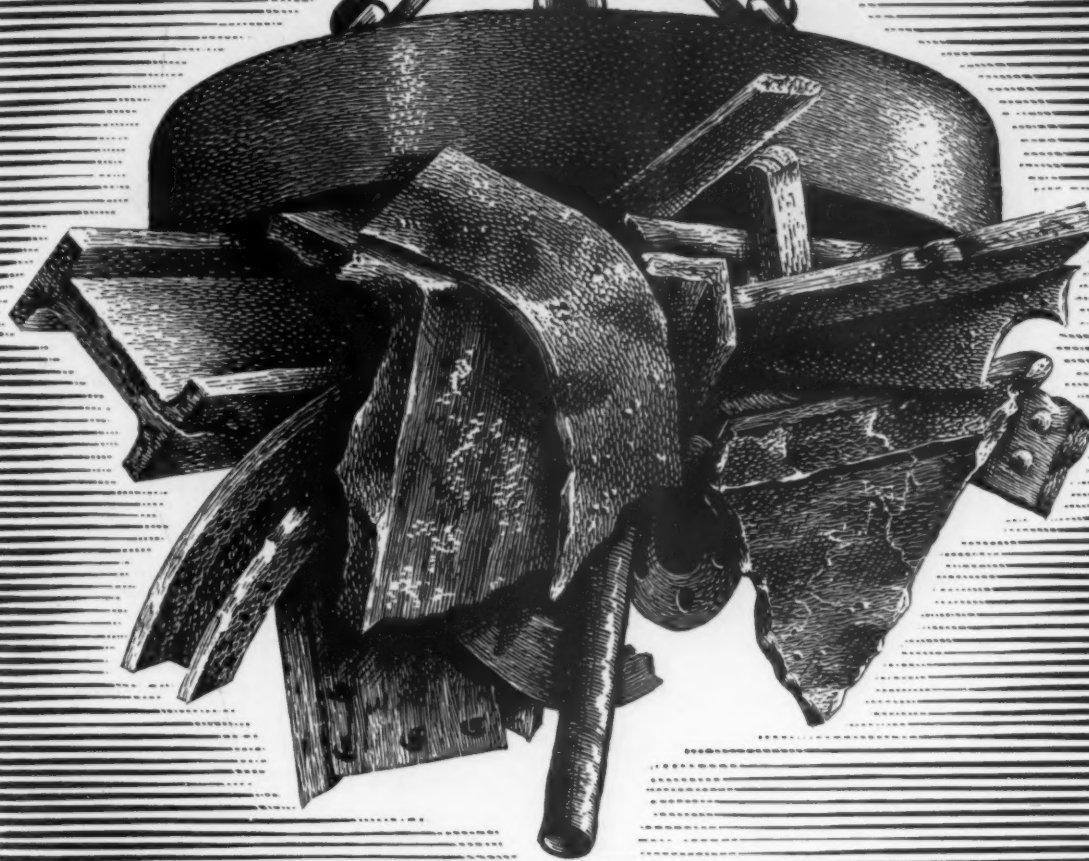
Cincinnati . . . A major area buyer came into the market at prevailing prices last week giving a firm tone to area dealings. Railroad lists closed at about \$32 net ton, almost \$3 over previous sales. Strong bids by Pittsburgh mills for railroad scrap leads some dealers to believe more scrap may be barged from Cincinnati soon. One Cincinnati area mill re-started its last blast furnace, out of operation since early this year.

Buffalo . . . A surprise dip of \$1 per ton was posted in steel grades here. The area's top mill placed orders with several dealers at the lower levels despite bidding by brokers that led to higher prices a week ago. Market also ignored a further 8-point rise in the district ingot rate. A sharp increase in basic iron output and heavy inventories at mills are bearish factors.

Boston . . . Market here is moving along at a fairly steady pace. Volume is definitely satisfactory but nobody is being rushed. Demand is steady for all grades except unstripped motor blocks.

West Coast . . . Log jam on prices in San Francisco was broken this week. Mills are again buying, and at higher prices. Market is expected to hold fairly stable for a while with the new higher price schedule slowing exports down somewhat.

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leadership in
Iron & Steel scrap
since 1889



Luria Brothers and Company, Inc.

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LINCOLN-LIBERTY BLDG.

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PLANTS

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READING, PENNA. MICHIGAN
MODENA, PENNA. PITTSBURGH, PENNA.
ERIE, PENNA.

OFFICES

| | | |
|-------------------|-------------------|---------------------|
| BIRMINGHAM, ALA. | DETROIT, MICHIGAN | PITTSBURGH, PENNA. |
| BOSTON, MASS. | HOUSTON, TEXAS | PUEBLO, COLORADO |
| BUFFALO, N. Y. | LEBANON, PENNA. | READING, PENNA. |
| CHICAGO, ILLINOIS | LOS ANGELES, CAL. | ST. LOUIS, MO. |
| CLEVELAND, OHIO | NEW YORK, N. Y. | SAN FRANCISCO, CAL. |
| | SEATTLE, WASH. | |

November 11, 1954

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Scrap Prices

(Effective Nov. 9, 1954)

Pittsburgh

| | |
|----------------------------|--------------------|
| No. 1 hvy. melting | \$35.00 to \$36.00 |
| No. 2 hvy. melting | 31.00 to 32.00 |
| No. 1 bundles | 35.00 to 36.00 |
| No. 2 bundles | 27.90 to 28.00 |
| Machine shop turn. | 19.00 to 20.00 |
| Mixed bor. and ms. turns. | 19.00 to 20.00 |
| Shoveling turnings | 23.00 to 24.00 |
| Cast iron borings | 23.00 to 24.00 |
| Low phos. punch'gs, plate. | 37.00 to 38.00 |
| Heavy turnings | 31.00 to 32.00 |
| No. 1 RR. hvy. melting | 36.00 to 37.00 |
| Scrap rails, random lgth. | 40.00 to 41.00 |
| Rails 2 ft and under | 46.00 to 47.00 |
| RR. steel wheels | 38.00 to 39.00 |
| RR. spring steel | 38.00 to 39.00 |
| RR. couplers and knuckles | 38.00 to 39.00 |
| No. 1 machinery cast. | 42.00 to 43.00 |
| Cupola cast. | 37.00 to 38.00 |
| Heavy breakable cast. | 31.00 to 32.00 |

Chicago

| | |
|----------------------------|--------------------|
| No. 1 hvy. melting | \$33.00 to \$34.00 |
| No. 2 hvy. melting | 30.00 to 31.00 |
| No. 1 factory bundles | 34.00 to 35.00 |
| No. 1 dealers' bundles | 33.00 to 34.00 |
| No. 2 dealers' bundles | 23.00 to 24.00 |
| Machine shop turn. | 16.00 to 17.00 |
| Mixed bor. and turn. | 18.00 to 19.00 |
| Shoveling turnings | 18.00 to 19.00 |
| Cast iron borings | 18.00 to 19.00 |
| Low phos. forge crops | 38.00 to 39.00 |
| Low phos. punch'gs, plate. | 35.00 to 36.00 |
| Low phos. 3 ft and under | 34.00 to 35.00 |
| No. 1 RR. hvy. melting | 36.00 to 37.00 |
| Scrap rails, random lgth. | 44.00 to 45.00 |
| Rerolling rails | 55.00 to 56.00 |
| Rails 2 ft and under | 52.00 to 53.00 |
| Locomotive tires, cut | 36.00 to 37.00 |
| Cut bolsters & side frames | 38.00 to 39.00 |
| Angles and splice bars | 42.00 to 44.00 |
| RR. steel car axles | 44.00 to 45.00 |
| RR. couplers and knuckles | 37.00 to 38.00 |
| No. 1 machinery cast. | 42.00 to 43.00 |
| Cupola cast. | 39.00 to 40.00 |
| Heavy breakable cast. | 31.00 to 32.00 |
| Cast iron brake shoes | 32.00 to 33.00 |
| Cast iron car wheels | 34.00 to 35.00 |
| Malleable | 43.00 to 44.00 |
| Stove plate | 32.00 to 33.00 |

Philadelphia Area

| | |
|---------------------------|--------------------|
| No. 1 hvy. melting | \$32.50 to \$33.50 |
| No. 2 hvy. melting | 30.50 to 31.50 |
| No. 1 bundles | 32.50 to 33.50 |
| No. 2 bundles | 27.50 to 28.50 |
| Machine shop turn. | 18.50 to 19.50 |
| Mixed bor. short turn. | 19.00 to 20.00 |
| Cast iron borings | 19.00 to 20.00 |
| Shoveling turnings | 21.00 to 22.00 |
| Clean cast chem. borings. | 24.00 to 25.00 |
| Low phos. 5 ft and under | 34.00 to 35.00 |
| Low phos. 2 ft and under | 35.00 to 36.00 |
| Low phos. punch'gs | 35.00 to 36.00 |
| Elec. furnace bundles | 33.00 to 34.00 |
| Heavy turnings | 29.00 to 30.00 |
| RR. steel wheels | 34.00 to 35.00 |
| RR. spring steel | 34.00 to 35.00 |
| Rails 18 in. and under | 44.00 to 45.00 |
| Cupola cast. | 34.00 to 36.00 |
| Heavy breakable cast. | 35.50 to 36.50 |
| Cast iron car wheels | 41.00 to 42.00 |
| Malleable | 36.00 to 37.00 |
| Unstripped motor blocks | 27.00 to 28.00 |
| No. 1 machinery cast. | 42.00 to 43.00 |
| Charging box cast. | 36.00 to 37.00 |

Cleveland

| | |
|-------------------------------------|--------------------|
| No. 1 hvy. melting | \$32.00 to \$34.00 |
| No. 2 hvy. melting | 29.00 to 30.00 |
| No. 1 bundles | 32.00 to 34.00 |
| No. 2 bundles | 26.00 to 27.00 |
| No. 1 busheling | 31.00 to 33.00 |
| Machine shop turn. | 15.00 to 16.00 |
| Mixed bor. and turn. | 20.00 to 21.00 |
| Shoveling turnings | 20.00 to 21.00 |
| Cast iron borings | 20.00 to 21.00 |
| Cut struct'l & plates, 2 ft & under | 39.00 to 40.00 |
| Drop forge flashings | 31.00 to 32.00 |
| Low phos. 2 ft & under | 31.00 to 32.00 |
| No. 1 RR. heavy melting | 34.00 to 35.00 |
| Rails 3 ft and under | 47.00 to 48.00 |
| Rails 18 in. and under | 49.00 to 50.00 |
| Railroad grate bars | 27.00 to 28.00 |
| Steel axle turnings | 27.00 to 28.00 |
| Railroad cast. | 45.00 |
| No. 1 machinery cast. | 44.00 |
| Stove plate | 38.00 to 39.00 |
| Malleable | 44.00 |

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Youngstown

| | |
|--------------------|--------------------|
| No. 1 hvy. melting | \$35.00 to \$36.00 |
| No. 2 hvy. melting | 29.00 to 30.00 |
| No. 1 bundles | 35.00 to 36.00 |
| No. 2 bundles | 25.00 to 26.00 |
| Machine shop turn. | 17.00 to 18.50 |
| Shoveling turnings | 22.00 to 23.50 |
| Cast iron borings | 22.00 to 23.50 |
| Low phos. plate | 35.00 to 36.00 |

Buffalo

| | |
|---------------------------|--------------------|
| No. 1 hvy. melting | \$30.00 to \$31.00 |
| No. 2 hvy. melting | 26.50 to 27.50 |
| No. 1 busheling | 30.00 to 31.00 |
| No. 1 bundles | 30.00 to 31.00 |
| No. 2 bundles | 24.50 to 25.50 |
| Machine shop turn. | 17.50 to 18.50 |
| Mixed bor. and turn. | 19.50 to 20.50 |
| Shoveling turnings | 20.50 to 21.50 |
| Cast iron borings | 19.50 to 20.50 |
| Low phos. plate | 34.00 to 35.00 |
| Scrap rails, random lgth. | 35.00 to 36.00 |
| Rails 2 ft and under | 42.00 to 43.00 |
| RR. steel wheels | 36.00 to 37.00 |
| RR. spring steel | 36.00 to 37.00 |
| RR. couplers and knuckles | 36.00 to 37.00 |
| No. 1 machinery cast. | 43.00 to 44.00 |
| No. 1 cupola cast. | 38.00 to 39.00 |

Detroit

| | |
|---|--------------------|
| Brokers buying prices per gross ton, on cars: | |
| No. 1 hvy. melting | \$25.00 to \$26.00 |
| No. 2 hvy. melting | 20.00 to 21.00 |
| No. 1 bundles, openhearth. | 26.00 to 27.00 |
| No. 2 bundles | 18.00 to 19.00 |
| New busheling | 24.00 to 25.00 |
| Drop forge flashings | 24.00 to 25.00 |
| Machine shop turn. | 11.00 to 12.00 |
| Mixed bor. and turn. | 13.00 to 14.00 |
| Shoveling turnings | 13.00 to 14.00 |
| Cast iron borings | 13.00 to 14.00 |
| Low phos. punch'gs, plate. | 27.00 to 28.00 |
| No. 1 cupola cast. | 34.00 |
| Heavy breakable cast. | 25.00 |
| Stove plate | 30.00 |
| Automotive cast. | 38.00 |

St. Louis

| | |
|--------------------------|--------------------|
| No. 1 hvy. melting | \$31.00 to \$32.00 |
| No. 2 hvy. melting | 28.00 to 29.00 |
| No. 1 bundles | 30.00 to 31.00 |
| No. 2 bundles | 23.50 to 24.50 |
| Machine shop turn. | 15.50 to 16.50 |
| Cast iron borings | 15.50 to 16.50 |
| Shoveling turnings | 17.00 to 18.00 |
| No. 1 RR. hvy. melting | 34.50 to 35.50 |
| Rails, random lengths | 40.50 to 41.50 |
| Rails, 18 in. and under | 47.00 to 48.00 |
| Locomotive tires, uncut | 34.00 to 35.00 |
| Angles and splice bars | 35.00 to 36.00 |
| Std. steel car axles | 36.00 to 37.00 |
| RR. spring steel | 35.00 to 36.00 |
| Cupola cast. | 44.00 to 45.00 |
| Hvy. breakable cast. | 35.00 to 36.00 |
| Cast iron brake shoes | 30.00 to 31.00 |
| Stove plate | 36.00 to 37.00 |
| Cast iron car wheels | 35.50 to 36.50 |
| Malleable | 35.00 to 36.00 |
| Unstripped motor blocks. | 34.00 to 35.00 |

New York

| | |
|---|--------------------|
| Brokers buying prices per gross ton, on cars: | |
| No. 1 hvy. melting | \$26.00 to \$27.00 |
| No. 2 hvy. melting | 23.00 to 24.00 |
| No. 2 bundles | 19.00 to 20.00 |
| Machine shop turn. | 9.00 to 10.00 |
| Mixed bor. and turn. | 10.00 to 11.00 |
| Shoveling turnings | 12.50 to 13.50 |
| Clean cast chem. borings. | 18.00 to 19.00 |
| No. 1 machinery cast. | 35.00 to 36.00 |
| Mixed yard cast. | 29.00 to 30.00 |
| Charging box cast. | 29.00 to 30.00 |
| Heavy breakable cast. | 27.00 to 28.00 |
| Unstripped motor blocks. | 22.00 to 23.00 |

Birmingham

| | |
|-----------------------------|--------------------|
| No. 1 hvy. melting | \$26.00 to \$27.00 |
| No. 2 hvy. melting | 24.00 to 25.00 |
| No. 1 bundles | 23.00 to 24.00 |
| No. 2 bundles | 19.00 to 20.00 |
| No. 1 busheling | 23.00 to 24.00 |
| Machine shop turn. | 15.00 to 16.00 |
| Shoveling turnings | 16.00 to 17.00 |
| Cast iron borings | 16.00 to 17.00 |
| Electric furnace bundles. | 29.00 to 30.00 |
| Bar crops and plate | 33.00 to 34.00 |
| Structural and plate, 2 ft. | 33.00 to 34.00 |
| No. 1 RR. hvy. melting | 31.50 to 32.50 |
| Scrap rails, random lgth. | 36.00 to 37.00 |
| Rails, 18 in. and under | 40.00 to 41.00 |
| Angles & splice bars | 38.00 to 39.00 |
| Rerolling rails | 42.00 to 43.00 |
| No. 1 cupola cast. | 45.00 to 46.00 |
| Stove plate | 42.00 to 43.00 |
| Charging box cast. | 22.00 to 23.00 |
| Cast iron car wheels | 33.00 to 34.00 |
| Unstripped motor blocks. | 35.00 to 36.00 |
| Mashed tin cans | 15.00 to 16.00 |

Boston

| | |
|---|--------------------|
| Brokers buying prices per gross ton, on cars: | |
| No. 1 hvy. melting | \$21.00 to \$22.00 |
| No. 2 hvy. melting | 17.50 to 18.25 |
| No. 1 bundles | 23.00 to 24.00 |
| No. 2 bundles | 16.00 to 17.00 |
| No. 1 busheling | 21.00 to 22.00 |
| Elec. furnace, 3 ft & under | 24.00 to 25.00 |
| Machine shop turn. | 7.00 to 8.00 |
| Mixed bor. and short turn. | 9.00 to 10.00 |
| Shoveling turnings | 10.00 to 11.00 |
| Clean cast chem. borings. | 13.00 to 14.00 |
| No. 1 machinery cast. | 29.00 to 30.00 |
| Mixed cupola cast. | 26.00 to 27.00 |
| Heavy breakable cast. | 25.00 to 26.00 |
| Stove plate | 25.00 to 26.00 |
| Unstripped motor blocks | 18.00 to 19.00 |

Cincinnati

| | |
|---|--------------------|
| Brokers buying prices per gross ton, on cars: | |
| No. 1 hvy. melting | \$31.00 to \$33.00 |
| No. 2 hvy. melting | 29.00 to 31.00 |
| No. 1 bundles | 30.00 to 31.00 |
| No. 2 bundles | 22.00 to 23.00 |
| Machine shop turn. | 17.00 to 18.00 |
| Mixed bor. and turn. | 18.00 to 19.00 |
| Shoveling turnings | 18.00 to 19.00 |
| Cast iron borings | 18.00 to 19.00 |
| Low phos., 18 in. & under. | 36.00 to 38.00 |
| Rails, random lengths | 39.00 to 40.00 |
| Rails, 18 in. and under | 47.00 to 48.00 |
| No. 1 cupola cast. | 39.00 to 40.00 |
| Hvy. breakable cast. | 35.00 to 36.00 |
| Drop broken cast. | 44.00 to 45.00 |

San Francisco

| | |
|------------------------|------------------|
| No. 1 hvy. melting | \$24.00 |
| No. 2 hvy. melting | 20.00 |
| No. 1 bundles | 23.00 |
| No. 2 bundles | 18.00 |
| No. 3 bundles | 14.00 |
| Machine shop turn. | 6.00 |
| Cast iron borings | 9.00 |
| No. 1 RR. hvy. melting | 24.00 |
| No. 1 cupola cast. | \$43.00 to 46.00 |

Los Angeles

| | |
|----------------------------|---------|
| No. 1 hvy. melting | \$22.00 |
| No. 2 hvy. melting | 20.00 |
| No. 1 bundles | 21.00 |
| No. 2 bundles | 18.00 |
| No. 3 bundles | 14.00 |
| Machine shop turn. | 6.00 |
| Shoveling turnings | 9.00 |
| Cast iron borings | 9.00 |
| Elec. furn. 1 ft and under | 27.00 |
| No. 1 RR. hvy. melting | 22.00 |
| No. 1 cupola cast. | 43.00 |

Seattle

| | |
|--------------------|---------|
| No. 1 hvy. melting | \$27.00 |
| No. 2 hvy. melting | 23.00 |
| No. 1 bundles | 20.00 |
| No. 2 bundles | 17.00 |
| No. 3 bundles | 13.00 |
| No. 1 cupola cast. | 35.00 |
| Mixed yard cast. | 35.00 |

Hamilton, Ont.

| | |
|---------------------------|------------------|
| No. 1 hvy. melting | \$26.00 |
| No. 2 hvy. melting | 23.00 |
| No. 1 bundles | 26.00 |
| No. 2 bundles | 21.00 |
| Mixed steel scrap | 16.00 |
| Bushelings | 17.00 |
| Bush., new fact prep'd | 24.00 |
| Bush., new fact unprep'd. | 20.00 |
| Short steel turnings | 12.00 |
| Mixed bor. and turn. | 12.00 |
| Rails, remelting | 31.00 |
| Cast scrap | \$42.00 to 45.00 |



Ammo

for "Old Hickory"

On January 8, 1815, fifteen days after a peace treaty had been signed, General Jackson effectively fought from behind cotton bales to repulse the British at New Orleans. His ammunition, guns and howitzers came from Pittsburgh's first successful foundry—established in 1805 by Joseph McClurg, Joseph Smith and John Gormley—later known as McClurg's and McKnight's.

Today, hundreds of successful mills and foundries throughout the nation must maintain a continuing output of steel products—not only for the military, but also for the civilian requirements of more than 160 million people. And scrap is an indispensable ingredient.

For the purchase or sale of iron or steel scrap . . .

phone or write "Your Chicago Broker"



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Shortage Keeps Copper Tight

Government release of over 50,000 tons of copper prevents shutdowns . . . But supplies still short . . . See gradual easing . . . Hold 30.00¢ price—By R. L. Hatschek.

♦ **SHORT** supply continues to plague copper consumers despite the release of over 50,000 tons of government-owned or stockpile-destined metal. Prospects are that the market will ease gradually and that almost nobody will be seriously hurt.

But while domestic producers are holding on to the current 30.00¢ price, Chile is out trying to sell copper for January delivery at a higher price. Some domestic dealer sales are also reported as high as 33¢ and scrap prices have also risen.

Referring to the long-term picture, however, G. W. Proffitt, executive secretary of the Copper and Brass Warehouse Assn., has come out stamping copper shortage stories as false rumors. He states that every time someone predicts the exhausting of supplies, someone else reports a new-high grade find. This would seem to be borne out by the recent discovery of American Metal Co. in Canada of a good-looking copper-lead-zinc orebody.

Elsewhere in the markets, lead and zinc have dropped back to a quiet pace now that stockpiling activity has ended its flurry for October.

COPPER . . . Despite something over 50,000 tons of government copper pumped into the fourth quarter pipeline, the market remains in short

supply. Situation is expected to ease gradually. But right now copper is in a position where a higher price wouldn't have too much difficulty in sticking. But, while some dealer copper is being sold at premiums, the producers are holding fast to the 30.00¢ level.

On the secondary side, custom smelters have again boosted buying prices by ½¢ per lb. They now quote 28.50¢ for No. 1 copper, 27¢ for No. 2 and 25.50¢ for light copper. As this issue went to press, ingot makers had not followed but scrap dealers did up their buying prices ½¢ over last week's quotations for copper.

In Washington, the Export-Import Bank says it is ready to lend the American Smelting & Refining Co. up to \$100,000. The loan would be earmarked for developing the Toquepala copper project in southern Peru, one of the 10 largest copper mines in the world. Engineers say about 140,000 tons of blister copper can be produced each year for 10 years. After that, production would drop off to about 90,000 tons.

LEAD . . . General Services Administration last week accepted offers of lead for the stockpile at the going market price of 15.00¢ per lb. Trade sources estimate the tonnage was approximately 10,000 tons, about what was purchased by stockpilers in October. Thus, the government continues to support the market in the face of light demand from consumers.

Meanwhile, the London market maintains its strength with the price there climbing about ¾¢ per lb higher

than parity with New York late last week. This was, at least in part, attributed to an Australian dock strike.

ZINC . . . Higher automotive demand for diecastings and continued strength of galvanized steel are maintaining zinc consumption at a healthy pace. And stockpilers are still removing metal from the market, about 12,000 to 15,000 tons this month, trade sources estimate. But in London the market is still about ½¢ below the New York equivalent price.

While domestic prices remain firm, primarily as a result of the stockpiling activity, there still seems to be an undertone of weakness. This is attributed by many to healthy supplies, including foreign material. Stocks, which have been declining in recent months, are still a tremendous burden on the market.

ALUMINUM . . . Bureau of Mines, in its September aluminum statistics, reports that stocks held at reduction plants declined 30 pct during the month. Heavy shipments cut into the 70,259-ton inventory and brought it down to 48,872 tons. This was only the second consecutive month of decline—but stocks are now at the lowest point reported since sometime in February. Production, of course, had tapered off somewhat from the alltime high set in July.

Interesting to note, the Bureau credits "extensive national advertising" by the producers with increasing producers' shipments of both primary pig and ingot.

MAGNESIUM . . . In a move designed to improve magnesium's competitive position with regard to other metals Dow Chemical Co. has reduced the price of AZ91B diecasting alloy. In addition, the firm is giving a freight allowance at carload rate.

Price cut is 1¢ per lb and the freight allowance will save consumers approximately another 1¢. New price is 26¢ per lb east of the Rockies, 27½¢ on the other side as compared to the old price of 27¢ per lb f.o.b. Madison, Ill.

TUNGSTEN . . . General Electric Co. is planning to market pure tungsten and molybdenum products through the firm's Cleveland wire works. They will be available in powder, rod, wire and sheet form as well as fabricated products. And GE is building a \$1.7 million experimental plant for development of new tungsten and molybdenum products and for improvement of older ones.

Daily Nonferrous Metal Prices

(Cents per lb except as noted)

| | Nov. 3 | Nov. 4 | Nov. 5 | Nov. 6 | Nov. 8 | Nov. 9 |
|-------------------------|--------|--------|--------|--------|--------|--------|
| Copper, electro, Conn. | 30.00 | 30.00 | 30.00 | 30.00 | 30.00 | 30.00 |
| Copper, Lake, delivered | 30.00 | 30.00 | 30.00 | 30.00 | 30.00 | 30.00 |
| Tin, Straits, New York | 92.00 | 91.50 | 91.50 | | 91.25 | 91.25* |
| Zinc, East St. Louis | 11.50 | 11.50 | 11.50 | 11.50 | 11.50 | 11.50 |
| Lead, St. Louis | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 |

Note: Quotations are going prices

*Tentative

SITUATION UNDER CONTROL

BY KEOKUK

Chief Keokuk: "Little Chief know sailfish put up good fight. Me not know they fight this good!"

Princess Wenatchee: "But as usual he has the situation under control!"



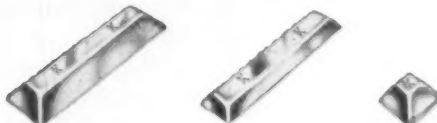
K

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KEOKUK, IOWA

WENATCHEE DIVISION, WENATCHEE, WASHINGTON

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November 11, 1954

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THE CLEARING HOUSE

News of Used and Rebuilt Machinery

Uptrend In Cleveland . . . The current spurt in auto production on 1955 models is moving into the used machinery business in the Cleveland area, one of the major supply centers. And good reconditioned units are enabling many a smaller machine shop to get back on the subcontracting bandwagon.

One Cleveland dealer said last week his business during October was up 33 pct over September. This in turn was up 50 pct over the low point of August, "but nothing times nothing is still nothing," he added in recollection of that sad experience.

This dealer feels the spurt has about reached the levelling-off period and will continue largely unchanged through the rest of the year.

Parts Suppliers Buy . . . Major buyers now are small parts suppliers, principally for autos, but also including appliances, aircraft parts and most other phases of metalworking. One of the largest auto-makers has pulled in subcontracts for small stampings since a new company plant will shortly be producing these. But two of the leading independent suppliers have let scores of new subcontracts as the revival of auto production found their own facilities taxed when business picked up in the interim.

Hottest items for one used machinery firm are profilers, punch presses and turret lathes. This indicates emphasis on all-around job machines for small shops rather than automatic production equipment. Credit is becoming less of a problem as promises materialize into orders.

Seek Grinders . . . A second leading house in Cleveland is seeking surface grinders and universal mills with radial drills and internal and external grinders in

second place. Weakest items are screw machines.

A little more business is not going to the machinery buyer's head by any means. In Cleveland price and quality are still the pivot points with delivery getting secondary consideration since stocks and choice are ample.

Hold Biggest Auction . . . The U. S. Army realized \$1,811,459.35 from the sale of surplus at "Operation Jumbo"—the largest auction in Army's history, concluded recently at Sharpe General Depot, Lathrop, Calif.

The materials, machines and vehicles offered were surplus at four Army installations, each within an 80-mile radius of San Francisco.

According to Department of Defense statistics, the amount taken in at this sale represented the largest total of any sale conducted by the Department.

Wershow and Weisz, Los Angeles auctioneers, disposed of the 1482 separate lots, which represented an original acquisition cost to the Government of over \$24 million, to 447 separate buyers in three days of selling.

Show Machinery Bargains . . . Some typical used machinery buys were: small Sheldon and South Bend lathes with 3½ and 4 ft beds sold at an average of \$55,000. An 8 ft 16 in. swing lathe brought \$1425.00. A Sheldon 10 in. swing 4¼ ft bed engine lathe with underneath motor drive and quick change attachment was sold for \$750.00. Portable bench grinders with ½ h.p. motors sold for \$325.00 each in lots from 7 to 20 pieces.

The buyer of the first lot offered early Monday morning probably hadn't been fully awakened, since he paid \$225.00 for a bench type drill press which originally cost the Army \$145.00.